AN EXPLANATORY PHONOLOGY OF THE DECCANI URDU OF HYDERABAD

ABSTRACT

THESIS SUBMITTED FOR THE AWARD OF THE DEGREE OF

Doctor of Philosophy

IN

LINGUISTICS

BY

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Under the Supervision of

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DEPARTMENT OF LINGUISTICS
ALIGARH MUSLIM UNIVERSITY
ALIGARH (INDIA)

1998

ABSTRACT

The thesis presents a phonological analysis of the Deccani Urdu of Hyderabad in the theoretical framework of the Columbia school of linguistics. Although the origin of this theory can be traced back to Ferdinand de Saussure's *course de linguistique generale* (1916), the theory has fully been developed by Professor William Diver and his students at Columbia University. Besides N.S. Trubetzkoy of the Prague school, Professor William Diver has also greatly benefited from his teacher Andre Martinet, in the development of phonological theory in particular. The independently known and verifiable five orienting principles of this theory, namely, physiological mechanism, human behavior, communication, acoustic medium, and vision together provide the setting for the study of phonology with which the present analysis is associated. Thus, it is through these quintuple orientations that we provide motivated rationale for the paradigmatic and syntagmatic asymmetries as encountered in Deccani Urdu phonology.

In the Introduction, we dealt with the historical setting of Hyderabad Urdu, the field procedures utilized in the collection and analysis of the data, the theoretical principles that motivate the phonological analysis, and the scope of the study.

Further, we have taken up each of the quintuple orientations in separate chapters in the thesis to provide explanation for the particular skewings observed in the paradigmatic make-up and syntagmatic distribution of phonological units in Deccani Urdu.

In the first chapter, the physiological mechanism as an orienting principle has fully been discussed with a view to providing explanations for the paradigmatic and syntagmatic asymmetries of the phonological units in Deccani Urdu. All phonological units both consonantal and vocalic, are projected on the relevant intersections of the basic physiological parameters of the articulators and the apertures to form the network of these units which is formally termed as the phonological grid. We observed clear skewings both in the organization of the phonological units in the grid and in the syntagmatic distribution of these units in the word. As the distribution of phonological units is not uniform, all these paradigmatic and combinatory asymmetries of the phonological units of Deccani Urdu have been explained in terms of the physiological mechanism as an orienting principle in this chapter.

Further, it has been argued that the differing degrees of adroitness of the supraglottal articulators has an impact on both the paradigmatic make-up of phonological units and in their syntagmatic usage in the word in Deccani Urdu. As a

yadstick, the scale of adroitness of supraglottal articulators has been set up, with the apex as the most adroit, the dorsum and the labium as more adroit, the medium as less adroit, and the post dorsum as the least adroit. In accordance with this scale relationship, it is predicted that the apical consonants should be most preferred both in the number of units and in their frequency of usage in the word in Deccani Urdu followed by the labial/dorsal and medial consonants in that order. And it has been amply demonstrated through actual counts that the scale relationship is fully maintained.

It has also been argued that the structure and the shape of the medium-dorsum mass is ideally suited for the formation of the two resonant cavities, which are essentially needed for the production of vocalic units in a language. It has been shown through a diagram that the three articulators, namely, the medium, the front dorsum, and the back dorsum, in association with the clearly audible apertures, 4 through 9, produce 20 vocalic units in Deccani Urdu. Of these 20 vocalic units, 8 units are produced by medium, 8 units by back dorsum, and 4 units by front dorsum. It has been noted that notwithstanding the angle of the jaws, there is a parity in the number of units for the back dorsal vowels *vis-a-vis* the medial vowels. In defense of this parity, it has been argued that as all the back dorsal vowels are labio-dorsal ("back rounded"), the impact of the angle of the jaw is more than compensated by

utilizing the labia as an additional articulator in the production of these vowels. That is why it becomes acoustically natural for the back dorsal vowels to have parity with the medial vowels. Likewise, the competitive figures for the frequency of usage of the back dorsal vowels with that of the medial vowels is again motivated by the use of labial articulators.

In the second chapter, the impact of human behavior has been evaluated on both the paradigmatic make-up and the syntagmatic distribution of phonological units in Deccani Urdu. Some of the phonological skewings as encountered in this dialect of Urdu, are in our judgement, clearly motivated by the human trait of intelligence (the power of inference) and laziness (the economy of effort).

It is these skewings that have been dealt in this chapter. In view of the well-known trait of human beings to minimize and economize in all situations, it is argued that the phonological units produced by fewer articulators are preferred over units produced by more articulators. For the simultaneous use of greater number of articulators requires fine and precise coordination of the articulators that is disfavored in terms of the human trait pertaining to the economy of effort. It is amply demonstrated through actual counts that the voiceless consonants, produced by fewer articulators, have been preferred over the voiced consonants, produced by more articulators in Deccani Urdu. Likewise, the

preference for oral vowels over nasal vowels in Deccani Urdu in again motivated by the fewer *versus* more articulators.

Further we have examined the apico-dental and apico-palatal consonants in terms of the human trait of preferring proximate place of articulation over remote place of articulation. In view of its extraordinary adroitness, the apex can come in contact with two places of articulation, namely, the teeth (adjacent place) and the palate (remote place). Thus, it becomes relatively difficult to produce apico-palatal consonants in terms of the human trait of economy of effort. It has been clearly demonstrated through actual counts that the apico-dental consonants have a preference over apico-palatal consonants, both in the number of units in the paradigm and in the frequency of usage in the word in Deccani Urdu.

Furthermore, in view of the general avoidance of fine and precisely coordinated movement of articulators, it is predicted that the phonological units that become similar due to the impact of assimilative trait of neighboring phonological units should be preferred. The skewed occurrences in favor of the similar and against the dissimilar combinations fully conforms to our expectations. We have also evaluated the impact of the degree of aperture change on the combinatory pattern of Deccani Urdu. It has been argued that larger changes of aperture which require less precision of control are preferred over small changes of apertures which require

greater precision of control. It is demonstrated through the potential and the actual occurrence of the three types of monosyllabic words (CVC, CVCC, CCVC) of Deccani Urdu that the CVC type which involve larger changes of aperture are drastically favored over the CVCC and the CCVC types. Further, it has also been examined that how human behavior orientation provides reinforcement to the validity of the phonological units in the grid in Deccani Urdu. The phonological skewings in the grid have been explained in view of the human preference for the physiologico-acoustically simpler, less complex phonological units.

In the third chapter, we have dealt with the orienting principle of communication to provide communicative rationale for the paradigmatic and syntagmatic skewings observed in Deccani Urdu. We have provided justification for 56 of the 60 phonological units presented in the phonological grid of Deccani Urdu. These 56 elemental units of communication ("phonemes") are established by way of contrast through minimal and subminimal pairs. Further, in view of the differing communicative load at the initial and final positions of the word, it is argued that all the four types of consonants (apical, labial, dorsal, and medial) compete well in the communicatively important word initial position, whereas the preferred apical consonants, produced by the most adroit apex, are highly favored over the non-apical consonants in the

communicatively less important word final position in Deccani Urdu. This discrepancy in the usage of consonants in the initial and final positions is clearly motivated by the communicative factor. Furthermore, we have also argued that the phonological units that are characterized with low communicative load are likely to be eliminated and merged with the neighboring units. Therefore the elimination and merger of the post dorsal q of modern standard Urdu into the front dorsal x of Deccani Urdu can be justified.

In the fourth chapter, we have evaluated the impact of vision as an orienting principle on the phonology of Deccani Urdu. Here, we have shown that the impact of vision is limited only to the syntagmatic organization of the word. A motivated rationale has been provided for the skewed occurrence of the labial units in the word initial position. It is argued that the drastic increase in favor of the labial consonants and against the non-labial consonants in the initial position of the words is brought about by the visibility factor of the labial articulator. Whereas in the final position of the word, the labial consonants are additionally disfavored due to the inverse impact of vision.

In the fifth chapter, we have gauged the impact of select acoustic aspects that have a bearing on the make-up and distribution of phonological units in Deccani Urdu. On the basis of acoustic audibility we have classified 60 phonological

units of Deccani Urdu into 20 vocalic (clearly audible) and 40 consonantal (less clearly audible). This audibility provides the theoretical basis to divide the lexical units into the monosyllabic, bisyllabic or the longer words on the basis of the combination of keystone and flanking units. The formation of the resonant cavities within the supraglottal cavity in the production of vocalic units has been discussed here. Further, the acoustic rationale has been provided for the rounding of the lips in the production of back dorsal vowels. We have also provided acoustic justification for the four-way classification of stops and gauged the impact of this classification on the frequency of usage of these stops in the monosyllabic words in Deccani Urdu.

The phonological analysis presented here, departs radically from the traditional analysis in that here we have provided an explanation of the non-random distribution of phonological units in both their paradigmatic make-up and combinatory organization in the word in terms of the independently known and verifiable quintuple orientations.

The thesis contains both theoretical and methodological innovations in the study of Deccani Urdu. The analysis presented here abondons description in favor of explanation, and employs quantitative procedures for verifying the hypothesis. The results of this study support the claim that phonology is not random but motivated.

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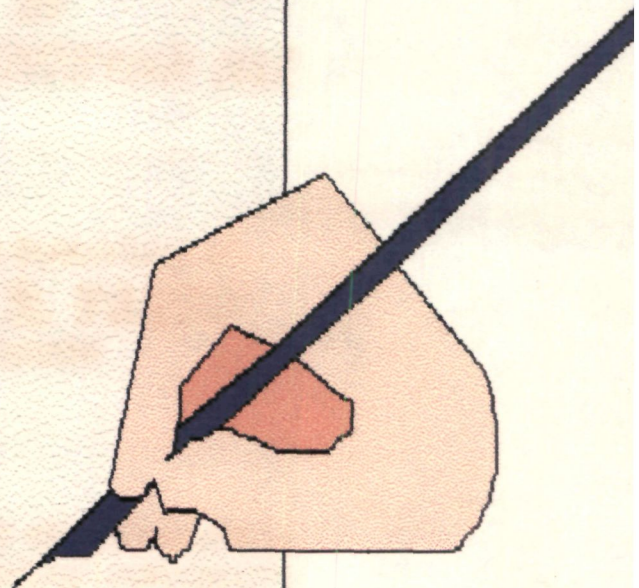
In
The
Memory
Of
My
Father



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Certificate

This is to certify that the thesis, entitled **"An Explanatory Phonology of the Deccani Urdu of Hyderabad"** submitted by **Mr. Syed Ekhteyar Ali** in partial fulfillment of the requirements for the award of the degree of Doctor of Philosophy in Linguistics, has been completed under my supervision.

It is further certified that **Mr. Syed Ekhteyar Ali** has fulfilled all the conditions laid down in the Academic Ordinances with regard to the Ph.D. Coursework, and that to the best of my knowledge the thesis contains his own research.

Dr. A. R. Fatihi
Supervisor

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However, I must take full responsibility for errors, inconsistencies, omissions and misrepresentations in this thesis.

November 10th, 1998 S. Ekhteyar Ali

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INTRODUCTION

INTRODUCTION

An explanatory phonology of the Deccani Urdu of Hyderabad, as presented in this thesis, is based on the speech of artisans, craftsmen, and unskilled laborers of the old city of Hyderabad, particularly those living in the localities around the Charminar, the famed Qutb Shahi tower with the four minarets. The analysis is carried out in the theoretical framework of the Columbia school of linguistics.

The introduction here is devoted to providing proper perspective for the phonological research presented in this thesis. This is done in four sections. In section A, we deal with the historical setting of Hyderabad Urdu. In section B, we describe the field procedures utilized in the collection and analysis of the data. In section C, we present an outline of the theoretical principles that motivate the phonological analysis. In section D, we specify the scope of the present analysis.

Section A: Historical setting of the Deccani Urdu of Hyderabad

The City of Hyderabad, now the state capital of Andhra Pradesh, was founded on the River Musi, five miles east of Golcunda, in 1590-91 by Sultan Muhammad Quli Qutb Shah. The City with a history of four hundred years is now the fifth largest city in India with a population of two and a half millions. It is perched on the top of the Deccan Plateau, 1776

feet above the sea level, and sprawls over an area of 100 square miles.

The City of Charminar has been described as the Panchavani Sangam, a place where five linguistic and cultural streams meet. For Telugu, Marathi, Kannada, Tamil and Urdu have harmoniously mingled to enrich this city famous for its Nawabi traditions and graciousness.

The twin cities of Hyderabad and Secunderabad are separated by Husain Sagar, an artificial lake constructed in 1562 by Husain Shah Wali, during the reign of Ibrahim Quli Qutb Shah.

In the 16th century, the city grew spontaneously to accommodate the surplus population of Golcunda, which was the capital of the kingdom of Golcunda (1512-1687) under the Qutb Shahi dynasty. Many buildings sprang up along the River Musi and gradually the City of Hyderabad grew.

The poet king of Golcunda, Sultan Muhammad Quli Qutb Shah, while laying the foundation of this historic city, prayed thus to the Almighty God:

مرا شہر لوگاں سوں معمور کر
رکھیا جوں تو دریا میں من یا سمیع

mera: ʃAhr lo:ga:ⁿ su:ⁿ ma:ⁿmu:r·kAr
rAkʰya: ju:ⁿ tu: dArya: me: mAⁿn, ya: sAmi:

Fill this my city with people

As thou hast filled the ocean with fish, O Lord!

The kingdom of Golcunda was one of the five Muslim Kingdoms that flourished in South India, when the Mughal empire was firmly established in North India. Many rulers of these kingdoms were patrons of music, literature, and architecture. The Qutb Shahi kings of Golcunda particularly excelled in patronizing learning, and they were great builders as well. They contributed to the growth and development of Indo-Persian and Indo-Islamic literature and culture in Hyderabad. Further, they also patronized regional culture of the Deccan, symbolized by the Telugu language.

Finally, it may be noted that whereas Persian continued to be the vehicle of literary expression and enjoyed the status of the court language under the Great Mughals, the Qutb Shahi's patronized Urdu to the extent that besides being their court language, it became the medium of literary expression in the 16th and 17th centuries. In fact, Sultan Muhammad Quli Qutb Shah was himself a prolific poet of Urdu, and is regarded one of the best poets of the Deccan, before the development of Urdu literature in North India in the 18th century.

The glory of Golcunda ended in 1687, after a valiant struggle. Aurangzeb, the last of the great Mughal rulers, captured Golcunda after defeating Abul Hasan Tana Shah, the last king of Golcunda, who was imprisoned at Daulatabad,

near the Mughal capital of the Deccan at Aurangabad. Golcunda thus became part of the Deccan province of the Mughal empire.

After the death of Aurangzeb in 1707, Deccan was administered by a Subedar or Governor of the Mughal emperor. With the decline of the Mughal power, Mir Qamruddin Khan, the Governor of the Deccan, who bore the Mughal title of Nizam-ul-Mulk Feroze Jung Asaf Jah, established his supremacy in 1724. He thus became the first Nizam as the founder of the Asaf Jahi dynasty in the Deccan.

Asaf Jah I continued to maintain Aurangabad as the capital of his new state. In 1763, Nizam Ali Khan Asaf Jah II shifted the capital to Hyderabad. Soon afterwards, the Nizam's dominions in the Deccan became synonymous with the name of this city, for they came to be known as the Hyderabad State. The seven Nizams of the Asaf Jahi dynasty ruled the Deccan for nearly 225 years right up to 1948, when the Hyderabad State acceded to become part of Independent India.

When the British East India Company spread their hold over the country in the second half of the 18th century, the Nizam of Hyderabad soon won their friendship while still maintaining much of his sovereign authority. This relationship lasted to the very end of the British rule in India. Thus, the

title 'Faithful Ally of the British Government' was bestowed on Nizam VII, the last ruler of the Hyderabad State.

Like the kings of Golcunda, the Nizams of Hyderabad partronized Urdu language and literature. Urdu flourished as the official language of the Hyderabad State. This language also became the medium of instruction for higher education at Osmania University in Hyderabad. Further, the State partonized a great deal of research on Urdu language and literature in general, and on the Qutb Shahi literature in particular.

As the state capital of Andhra Pradesh, Hyderabad continues to be an important center of Urdu in the Republic of India. In fact, Urdu enjoys the status of the second state language after Telugu in Andhra Pradesh. As Hyderabad Urdu has been nurtured in a different linguistic and cultural milieu, this Deccani dialect of Urdu has acquired some distinctive phonological, grammatical, and lexical characteristics in comparison with the North Indian Urdu, and these distinctive features need to be thoroughly studied, particularly with the outlook of India as a linguistic area. Furthermore, the study of the Deccani Urdu of Hyderabad in its historical setting may also contribute to a better understanding of the origin of Urdu and Hindi as Indo-Aryan languages. The research undertaken in this thesis is aimed at a comprehensive phonological analysis of the Deccani Urdu of Hyderabad.

Section B: Field Procedures: The Collection and Collation of Data

The data for the present phonological analysis has been collected through fieldwork in the Charminar neighborhood of the City of Hyderabad. The native informants of this dialect of Deccani Urdu were carefully selected for the elicitation of the data.

For the purity and uniformity of data, we decided at the outset to study the speech of essentially illiterate persons--the artisans, the craftsmen, and the unskilled laborers--representing a cross section of the speech community in the old city of Hyderabad. The following native speakers were chosen to be our main informants for the collection of data:

Name	Sex	Age	Occupation	Locality
Athar Belal	Male	45 years	Laborer	Kalikaman
Zahid Hussain	Male	52 years	Banlga maker	Lad Bazar
Chand Bibi	Female	42 years	Bangle maker	Lad Bazar
Noor Fatima	Female	38 years	Embroidery maker	Patthargatti

It may be noted that although these informants lack formal education, they are familiar with the Urdu alphabet, and can read the holy Qur'an. Further, all these informants belong to the lower social strata of the Urdu speaking community so far as their income, occupation, and cultural heritage is concerned. It may also be noted that all the four informants that we have so carefully chosen, possess distinct and audible voices characterized by clear pronunciation.

Furthermore, it may be pointed out that our data collection process has been based on face to face interviews with the informants in their own localities, in various sittings, running into hours.

At the beginning, we made a non-restrictive collection of words, as they appear in the everyday speech of the informants, both in isolation and in the larger context of phrases and sentences. Soon afterwards, we embarked on an exhaustive collection of data, but limited it to all and only the monosyllabic words in the active vocabulary of a typical speaker of Hyderabad Urdu. This was mainly accomplished in two ways: (1) By a meticulous informant work with reference to objects and artifacts, person and profession, kith and kin, rituals and customs, and other ways of life in the community. (2) By using John T. Platts' monumental Dictionary as a potential guide for the elicitation of the monosyllabic words actually utilized in the Deccani Urdu of Hyderabad. Besides a complete collection of the monosyllabic words, we have also collected a large number of disyllabic and longer words for exemplification in support of our analysis. In fact, we have made an extensive use of the disyllabic and longer words throughout the thesis in validating our phonological analysis.

It is to be noted that each word of the data was recorded on a separate index card. Care was taken to record all the words at first in narrow transcription, with every discernible

phonetic detail for each segment of the word. On the basis of that data in narrow, phonetic transcription, we, then, established the phonemic inventory of the Deccani Urdu of Hyderabad in terms of the criteria generally followed in traditional American phonemics. The establishment of the phonemes, while still in the data collection process, enabled us to also write all the collected words on the index cards in broad, phonemic transcription.

Finally, it may be noted that an exhaustive collection of the monosyllabic words was made particularly to be a means to provide statistical support for the validity of the present phonological analysis. For we could clearly see that the phonological units or the "phonemes" established for the Deccani Urdu of Hyderabad are not equally utilized in the formation of words. Rather, there are sharp skewings in the distribution of these units in various positions and various combinations within the word.

We therefore made full use of the analysis pad which contains graph sheets. First, all the CVC words were plotted on the graph sheets. We used separate graph sheets for each initial consonant of these words. In each graph sheet, we then filled the slots for all those CVC words that begin with a particular initial consonant, followed by all the vowels in horizontal order and all the final consonants in vertical order. This enabled us to calculate the frequency of occurrence for

all the phonological units that appear in the CVC words, both horizontally and vertically. Then, we made use of additional graph sheets to determine the frequencies of the phonological units in the various positions of the other two types of the monosyllabic words, i.e., the CVCC words and the CCVC words, separately. The figures so obtained provide a quantitative basis to prove the favoring of certain phonological units over some others in the validation of the analysis for Deccani Urdu, as for any other language or dialect.

Section C: Theoretical Background[1]

The phonological analysis of Hyderabad Urdu presented in this thesis, is based on the theoretical framework of the Columbia school of linguistics. Although the origin of this theory can be traced back to Ferdinand de Saussure's Cours de linguistique générale (1916), the theory has fully been developed by Professor William Diver and his students at Columbia University. It may also be noted that N.S. Trubetzkoy of the Prague school has also been an important source of inspiration for the Columbia school, particularly for its phonological theory. Furthermore, in the development of

[1] Inasmuch as we have extensively incorporated Professor William Diver's ideas about language from both his lectures and his published and unpublished works throughout this thesis, it has not been possible for us to give proper references. But we will ever remain indebted to the noted Columbia University scholar for utilizing his concepts in our research. At the same time, we must take full responsibility for any misrepresentation of Professor Diver's theoretical viewpoint in the present research.

the Columbia school theory, Professor Diver has also greatly benefited from his teacher Professor Andre Martinet.

A brief account of the Columbia school linguistic theory, with particular reference to phonology, is presented in seven sections. In section C1, we characterize linguistic theory as containing three interrelated components: the orientation, the hypothesis, and the observable phenomena. In section C2, we outline briefly the role of the orienting principles in the make up of the theory of phonology, in relation to the phonological hypotheses and the phenomena (the sound waves of speech). In section C3, we present the concept of 'double articulation of language' to distinguish phonology from grammar. In section C4, we introduce the concept of the phonological grid, in contradistinction to the traditional 'inventory of phonemes'. In section C5, we highlight the importance of both 'substance' and 'value' in phonological analysis. In section C6, we deal with the 'syntagmatic' *versus* 'paradigmatic' relations in phonology. In section C7, we outline the procedures for the validation of phonological analysis.

Section C1: Linguistic Theory: The Orientation, the Hypothesis, and the Phenomena

Like any other scholarly discipline, the study of language consists of three parts: the orientation, the hypothesis, and the observable phenomena. In this tripartite

organization of the discipline, the hypothesis occupies a central position. For the task of the investigator is limited to demonstrating that the hypothesis he postulates (e.g., a five-vowel system for a language) fits with the observable data (the associated speech sounds) on the one hand, and is consistent with the orienting principles (e.g., the communicative intent) on the other. The term 'linguistic theory' will be used to indicate the overall relation among these three parts. It may also be noted that the linguistic theory itself consists of two sub-theories: the phonological and the grammatical.

Section C2: Orienting Principles for the Theory of Phonology

"It is well-known that language is used by human beings to communicate messages and that these messages are imparted by means of signals that are produced by the speaker through various manipulations and configurations of the vocal tract and are transmitted to the hearer through an acoustic medium". (Azim, 1978:6.) The signals produced by the visible vocal organs, such as labia, can also be perceived through eyes. It is these common facts about the character of language that provide five orienting principles for the study of language: (a) communication, (b) physiological mechanism, (c) acoustic medium, (d) human behavior, and (e) vision. Although only two of these principles, namely, communication

and human behavior, are directly relevant to the study of grammar, all the five orienting principles together provide the setting for the study of phonology with which the present analysis is associated.

It is noteworthy that these five orienting principles are independently known and verifiable. For these principles are true to other real world phenomena, irrespective of language. For instance, physiology of the vocal tract is as valid for the production of the speech sounds, as it is for other biological functions, such as, eating, chewing tasting, smelling and breathing.

The role of the five orienting principles in the make-up of the phonological theory, is outlined in five sections below.

Section C2(a): Communication

It will be generally agreed that language is fundamentally a device of communication. As we know, devices of communication, such as traffic lights or Morse code, transmit messages by means of signals. Thus, in a traffic light system, the signal green means 'go', yellow indicates 'caution', and red signals 'stop'. Likewise, particular signals or forms (signifiants) in association with their meanings (signifies) partake as units in the grammatical systems of a language. These signal-meaning units, referred to as *signes* by Ferdinand de Saussure, are therefore considered the basic units of grammar. However, it is to be

noted that communication also plays an equally important role in phonology.

As an orienting principle, communication justifies the use of meaning for establishing the phonological units of a language by contrast through minimally distinctive pairs of words. In fact, this is the procedure that is generally utilized in the American descriptive phonemics for establishing the 'phonemic inventory' of a language. It may however be noted that the American phonemicists establish the phonemes formally through distributional-substitutional criteria, and use the meaning-based procedure only as a short-cut for discovering the phonemes. On the contrary, we accept as our phonological units all the phonemes discovered by contrast through minimal pairs. For the principle of the 'phoneme', based on the distinctiveness of meaning, may be considered one manifestation of the communicative orientation of language.

Further, it may be noted that the communicative principle also affects the distribution of phonological units in the various positions of the word. It will be readily accepted that the beginning of the word carries a greater communicative load than the end of the word. In terms of this communicative rationale, we expect that a greater number of phonological units will be utilized in word initial position, whereas there will be a selective under-utilization of the phonological units of a

language in word final position. In fact, the classical case of the loss of distinction of voice in German and Russian in the final position of the word, can best be explained in terms of communicative load. It may be noted that the concept of communicative load was introduced by Andre Martinet under the term 'functional load'.

Section C2(b): Physiological Mechanism

Physiological mechanism as an orienting principle of phonology, highlights the role of the physiology of the vocal tract in the production of speech sounds. Humans are endowed with an improved sound producing mechanism (the vocal tract) as a result of which they are able to produce a large number of sounds by various manipulations and configurations of the vocal tract.

The basic physiological parameters that have a direct bearing on the theory of phonology, are presented in seven subsections below.

Section C2(b)(i): Articulators and Apertures

The articulators and the apertures are the devices of sound production based on the physiology of the vocal tract. The articulators are the adroit vocal organs; the apertures represent the various degrees of vertical openings of the vocal tract that are brought about by the movement of the lower jaw. The articulators combine with the degrees of

aperture to shape, and in some instances also to excite, the vocal cavity in the production of speech sounds.

The adroit vocal organs that function as articulators in the production of speech sounds, are: the labia, particularly the lower lip (producing labial sounds--p f w etc.); the apex, or blade, of the tongue (producing apical sounds--t s l r etc.); the medium of the tongue (producing medial sounds--c ʃ y etc.); the dorsum of the tongue (producing dorsal sounds-- k x etc.); and the post dorsum or the root of the tongue (producing post dorsal sounds, such as Arabic q); the velum, when it opens the nasal cavity for the production of the nasal sounds (m n etc.); and the glottis, i.e., the vocal folds as the glottal articulator (producing glottal sounds, such as glottal stop and h). The pharynx may also be counted as an articulator, for the musculature of its walls can bring about the production of 'pharyngeal fricatives' as used in Arabic.

The apertures, i.e., the vertical openings of the vocal tract in relation to the associated articulators, range from the total closure to the maximum opening. The degrees of aperture may be characterized as follows:

Aperture ∅: Complete stoppage of the stream of air coming from the lungs by an articulator and then the excitation of the vocal cavity by explosion, as in the production of p t k etc.

Aperture 1: Partial stoppage, so that air is forced between the articulator and the place of articulation, their surfaces in contact, exciting the cavity by frictional turbulence, as in the production of f and theta, etc.

Aperture 2: No stoppage, but the articulator forms a sufficiently narrow constriction so that it can control the air stream coming from the lungs, and thus excites the vocal cavity by channel turbulence, as in the production of s ʃ x etc.

Aperture 3,4,5,6 etc.: The articulators are used to produce resonant cavities with successively larger degrees of aperture. Aperture 3 is utilized in producing what are traditionally known as the 'liquids'--y r l w etc., whereas apertures 4 and above are used in the production of the vocalic sounds, traditionally known as 'vowels', e.g., i: u:; e: o:; a:.

The apertures may be classified into two broad divisions: Constrictions *versus* Openings and Clearly Audible *versus* Less Clearly Audible; the distinguishing character of these two divisions is taken up in the following subsections.

Section C2(b)(ii): Constrictions *versus* Openings

As pointed out above, apertures ∅,1 and 2 are formed in such a way that there is a closer contact between the surfaces

of articulators and the associated places of articulation. In view of their constrictive character, these apertures can produce turbulence for exciting the vocal cavity. As a result, articulators both shape and excite the vocal cavity in the production of speech sounds at all these apertures. Apertures zero through 2 may therefore be termed constrictions or constriction apertures.

Although both voiceless sounds (p f, t s, etc.) and voiced sounds (b v, d z, etc.) are produced at the constriction apertures, it must be pointed out here that the production of the voiced speech sounds is an added complexity at these apertures. For it requires an additional excitation of the vocal cavity through the vibrations of the vocal folds, thus necessitating the use of an extra articulator, the glottis.

In contradistinction to constriction apertures (zero through 2), the larger apertures (3 and above) are termed opening apertures or openings. As the opening of the vocal tract is too large to produce turbulence at these apertures, the supraglottal articulators only shape the vocal cavity, but they cannot excite it. It is the glottis as an articulator that excites the supraglottal cavity through voice by setting the edges of the vocal folds in vibration. Thus, voicing becomes a necessary concomitant for the production of speech sounds, both 'liquids' and 'vowels', at the opening apertures.

Section C2(b)(iii): Clearly Audible *versus* Less Clearly Audible Apertures

Besides constrictions *versus* openings, as pointed out earlier, the apertures lend themselves to one more broad division. This division of apertures is based on the acoustic criterion of audibility. Apertures ∅ through 3, which are associated with the production of consonantal sounds, are referred to as the less clearly audible apertures. In contradistinction, apertures 4 and above, which are ideally suited for the production of vocalic sounds, are termed the clearly audible apertures. (For details, of Chapter I, Diagram I-1, comment 4, and Chapter V, section A.)

Section C2(b)(iv): Role of the Larynx in the Production of Speech Sounds

Larynx contains the glottal articulator, namely, the vocal folds, perhaps the most important of all the vocal organs that partake in the production of speech sounds. The vocal folds "are two parallel transverse banks or bands extending from front to back" from the thyroid cartilage. (Bloch and Trager, 1942:16.) Being extremely adroit, the vocal folds may assume many glottal configurations to produce a variety of speech sounds. Thus, they bring about the production of the glottal stop and the glottal h, besides generating "voice", the various pitch levels, and aspiration.

In Urdu, three basic units, namely, the V(oicing), the voiceless A(spriation), and the voiced h, are produced by the glottal articulator. It is noteworthy that these three units play a significant role in the production of supraglottal phonological units in Deccani Urdu, as in other dialects of Urdu. This will be taken up, when we comment on the phonological grid of Deccani Urdu in Chapter I.

Section C2(b)(v): Hierarchy of the Adroitness of Lingual Articulators and the Relative Adroitness of the Labium

Different parts of the tongue--apex, medium, dorsum, and post dorsum (or root)--vary in their degrees of adroitness. For they significantly differ from each other in their structure and musculature.

The apex, the most adroit among the lingual and all other supraglottal articulators, has a thin and lightweight structure, highly flexible musculature and a triangular shape, containing the blade with the tip. As a result, the apex may be moved freely across the length and breadth of the vocal tract. In contrast, the post dorsum, or root, of the tongue, being thick and massy in musculature, is the least adroit among the lingual articulators. For it is hinged to the back of the oral cavity, and functions as a hilt to the tongue in general and to the dorsum in particular. As for the dorsum and the medium, they are alike in that they both have a massy structure and a

rectangular shape. But in terms of the degrees of adroitness, the medium has to be placed below the dorsum. For whereas the dorsum has a relatively more flexible musculature, the medium, with its slightly tighter muscles, functions as a hilt to the apex.

In terms of the degrees of adroitness postulated above, we may place the four lingual articulators on the scale of adroitness, as presented in Diagram 0-1.

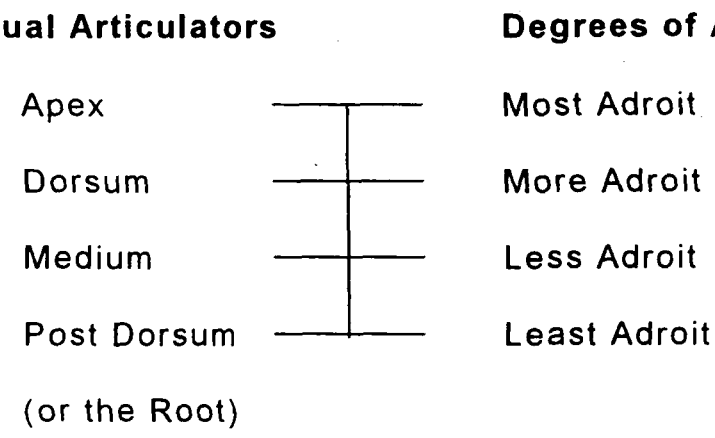

Diagram 0-1: Scale of Adroitness of Lingual Articulators

It may be noted that the impact of this scale of adroitness is limited to only the consonants. In terms of the scale, we expect that in a language or a dialect, the most adroit apex will be most productively utilized in the formation of the consonantal units, and in their frequency of occurrence in the word. On the contrary, we expect that the least adroit post dorsum may only occasionally be utilized in language to form a consonantal unit, such as the post dorsal q in modern standard Urdu. Further, we expect that such a post dorsal consonant may have a low frequency of usage in the word.

The dorsal ("velar") consonants (k g x γ etc.), and the medial ("palatal") consonants (c j ʃ etc.), produced by the more adroit dorsum and the less adroit medium respectively, may occupy the middle ground with regard to the number of units and the frequency of their usage. Of these two types of consonantal units, we expect, in terms of the scale, that the dorsal consonants may be preferred over the medial consonants.

Finally, a word about the *de facto* placement of the labium on the scale of adroitness for lingual articulators. It is well known that the labia as an articulator play an important role in the production of speech sounds, both consonantal and vocalic. But here, our approximate placement of the labium on the scale of adroitness is relevant to the analysis of only the labial consonants *vis-a-vis* the apical, the dorsal, the medial, and the post dorsal consonants.

As the labia are a highly flexible articulator with a fleshy musculature, and as the lower lip has a wide vertical range with the movement of the lower jaw, the labial articulator may well be placed somewhere near the dorsum on the scale of adroitness of articulators. For in terms of the physiology, the labium is certainly less adroit than the apex, and more adroit than the medium.

Section C2(b)(vi): The Medium-Dorsum Mass as the Articulator for Vowels

As outlined above, the apex is the most commonly used lingual articulator for the production of consonantal speech sounds. But with its triangular shape, smaller size, and lightweight structure, the apex is not suited to produce the clearly audible, vocalic sounds.

In contradistinction to the apex, the medium-dorsum of the tongue have a massy structure and a wide rectangular shape. Physiologically, therefore, the medium-dorsum, in combination with the labia, are ideally suited for the formation of supraglottal resonant cavities, which is a necessary requirement for the production of the clearly audible, vocalic sounds at larger apertures (4 and above).

It may be pointed out that the musculature of the medium-dorsum is divided into three articulators, namely, the medium, the front dorsum, and the back dorsum, which are traditionally known as "front", "central", and "back" of the tongue respectively.

Section C2(b)(vii): Asymmetry of the Vocal Tract

Andre Martinet has written about the asymmetry of the vocal tract and its repercussions on the formation of speech sounds. This asymmetry is mainly caused by the angle of the jaws. With its vertex at the joint of the upper and lower jaws, the very angle is formed when the oral cavity is opened by the

movement of the lower jaw. Therefore, the medial ("front") articulator is characterized with more vertical space for maneuver than the back dorsal ("back") articulator.

This physiological asymmetry of the vocal tract naturally has an impact on the make-up and distribution of phonological units, both consonantal and vocalic. Given the disparity in the vertical space in the front and the back of the vocal tract, we expect that more phonological units may be formed by the front articulator than by the back articulator. This is particularly significant for the vocalic units of a language. For we find that quite a few languages have fewer vowels in the back than in the front.

Section C2(c): Acoustic Medium

Signals of a language are transmitted through a particular medium, the acoustic medium. Therefore, acoustic medium, as an orienting principle, becomes important in the analysis of speech sounds, both vocalic and consonantal.

The vocalic sounds can be acoustically analyzed and properly identified in terms of the frequencies of the first three formants (F_1,F_2,F_3), as observed in the sound spectrograms. Likewise, the consonantal sounds are identified and classified with the help of acoustic cues which are obtained through spectrographic research.

It is noteworthy that the acoustic research has made a breakthrough in the study of speech sounds. For example, in

their study of the stop categories across langauges, Leigh Lisker and Arthur S. Abramson (1964) have successfully demonstrated that at least three stop types (b d g, etc; p t k, etc; p^h t^h k^h, etc.) can be clearly distinguished from one another by the single phenomeonon of voice onset time. However, as they have themselves pointed out, the characteristics of the fourth stop category, the voiced aspriates (b^h d^h g^h, etc.) cannot be accounted for by the voice onset continuum alone.

As for the voiced h and the voiced aspirates, these consonants can be properly analyzed in terms of both physiology and acoustics. For the "breathy voice" in these sounds is produced when the air from the lungs is forced through an unusual, narrow, triangular configuration of the glottis. (For further details, cf. Chapter I, Diagram I-1, comment 10, and Chapter V, Section D.)

Finally, it may be noted that some vocalic categories can also be properly analyzed in terms of physiologico-acoustic rationale. In the production of the "front" vowels, for example, a large resonance chamber is formed, extending form the glottis to the medium. And notwithstanding the angle of the jaws, there is sufficient vertical space for maneuver for the medium as an articulator in this triangular chamber. That is why this large chamber is more than adequate for the easy production and clear perception of the "front" vowels. On the

contrary, a much smaller chamber, from the glottis to the back dorsum, is formed in the production of the "back" vowels. It is to be noted that the width (the vertical space) of this triangular chamber is greatly reduced because of the angle of the jaws. As a result, the "back" vowels formed by the back dorsum as an articulator, would require greater precision of control in their production and an extra effort in their perception. This problem is solved by the formation of another resonance chamber from the back dorsum to the lips, through the rounding of the labia. For the vocalic distinctions made at the back dorsum are amplified through this front chamber. That is why rounding of the "back" vowels and the converse unroundedness of the "front" vowels is so naturally widespread in the languages of the world.

Section C2(d): Human Behavior

Language is a particular instance of human behavior. For it is greatly influenced by the underlying characteristics of human behavior: the human intelligence and the human laziness. As a repercussion of intelligence and laziness, human beings seek a minimax solution between accomplishment and effort, with minimum input and maximum output.

Human beings utilize their intelligence or problem solving ability to infer the meaning of even complex expressions, with the help of situation and context. Likewise,

they can jump to identify a word, such as pepper, on hearing only its first consonant or syllable, in a proper context of situation, such as eating in a restaurant.

The human laziness leads to the economy of effort, that is, a general avoidance of the use of a greater degree of precision than is necessary for the accomplishment of any given task.

Therefore, the power of inference and the economy of effort are the products of human intelligence and human laziness. And it is both inference and economy that together provide human justification for the particular make-up of a language, both phonological and grammatical.

Finally, it may be noted that quite a few phonological skewings in the number of units and their frequency of usage in the word, as encountered in languages, are explainable in terms of human behavior. For example, it is through the human trait pertaining to the economy of effort that we predict the preference of voiceless consonants (such as, p t k) produced by only the supraglottal articulators, over the voiced consonants (such as, b d g) produced by an additional, glottal articulator.

Section C2(e): Vision

It is well-known that vision plays a significant role in human communication. For watching people while they talk undoubtedly contributes to getting the message across; as you

hear the speech with your ears, you also read the face with your eyes. And of course, the eye becomes the main, indeed the only, organ of reception of speech for the deaf person who lip-reads. (Abercrombie, 1967:22.)

As noted earlier, vision is one of the five orienting principles of the Columbia school theory. But like physiology and acoustics, it too applies exclusively to phonology. Further, even in phonology, the impact of vision is limited to the make- up and distribution of the labial sounds, both consonantal and vocalic. For only these sounds are produced by the visible vocal organs--the labia.

Finally, it may be noted that the role of vision as an orienting principle, is most clearly discernible in the formation of morphemes and words in a language. Thus, in many languages, including Urdu, the frequency of the labial consonants is unusually high, in comparison with that of the apical, medial, or dorsal consonants, in the communicatively important initial position of the word. This skewed distribution of the labial and the non-labial consonants in word initial position, as we will explain later in Chapter IV, is mainly brought about by the interaction of vision and communication.

Section C3: Double Articulation of Language

The concept of "the double articulation of language" was developed by Andre Martinet. It highlights the minimization of

effort (the "economy") that can clearly be seen in full operation in human language, in both phonology and grammar.

The first articulation, as Martinet calls it, is that whereby every effect of experience to be communicated, every need that one wants to make known to another, is analyzed into a succession of units each of which is endowed with a vocal form (signal) and a meaning. These signal-meaning units, which emerge from the first articulation, are termed *signes*. What is even more significant from our viewpoint, is the fact that the signal part of each *signe*, or the signal-meaning pair, is further divisible into a series of distinctive sound units, i.e., the "phonemes". This is referred to as the second articulation of language.

It is noteworthy that a great deal of economy is achieved through the double articulation of language. The first articulation is economical in the sense that with a large but finite number of signal-meaning units (or *signes*), it is possible to express an infinite variety of messages through inference on the part of language users. These signal-meaning units, both grammatical and lexical, are not unique; they recur in different combinations in everyday discourse to convey various aspects of human experience. But if we were to set up an artificial system of communication, it would require a separate signal-meaning unit for each and every individual experience. Such a system would therefore have to have an

infinite number of units to cover all human experience, a number too great for even a computer to remember.

As compared to the economy by the first articulation, a greater degree of economy is achieved by the second articulation of language. For only a few dozens of distinctive phonological units (or "phonemes") are employed in different combinations to form the entire inventory of the signals for the signal-meaning pairs (or the *signes*) of a language.

Following Martinet's concept of the double articulation of language, the Columbia school linguistic theory is divided into two parts: phonological and grammatical. Inasmuch as the research presented in this thesis deals with phonology, it is only the phonological theory that is outlined in the Introduction here.

Section C4: Phonemic Inventory *versus* Phonological Grid

The "phonemic inventory" of the American structuralist school looks similar in some respects to the phonological grid of the Columbia school. It may however be noted that the inventory of phonemes and the phonological grid are to be differentiated from each other, for they are based on different parameters.

In American "descriptive phonemics", it appears that the phonemic inventory is a mere collection or listing of the phonemes of a language. To be sure, the list of the phonemes is presented with reference to the points of articulation and

the manner of articulation for consonants, and in terms of the parts of the tongue raised and the height of the tongue raised for the vowels. However, the above reference labels are apparently used for the convenience of identifying the individual phonemes of a language. Furthermore, it appears that the phonemic inventory does not emphasize the interrelationships of the phonemes.

In contradistinction to the phonemic inventory, the phonological gird of a language is organized in terms of articulators and apertures as devices of sound production, based on physiology and acoustics. As pointed out in section C2(b) above, all phonological units of a language, both consonants and vowels, are placed on the intersections of the relevant articulators and apertures. Further, the phonological grid is basically a network of phonological units representing their interrelationships.

We may also note that whereas the concepts of "pattern congruity" (i.e. symmetry) and "economy" (i.e. setting fewer phonemes) are utilized by American phonemicists in the construction of the phonemic inventory, our principles emphasize an asymmetrical pattern and a different kind of economy (i.e., that of articulation) for the phonological grid.

In both Columbia school phonology and American descriptive phonemics, the basic phonological units (or the "phonemes") of a language are established by contrast

through minimal and subminimal pairs. However, as this procedure involves the recognition of meaning in phonemic analysis, the descriptive phonemicists use it only as a short-cut for discovering the phonemes. For they insist that the phonemes must formally be established through distributional -substitutional criteria.

In the Columbia school phonology, on the other hand, it is perfectly all right to make full use of meaning for the identification of phonological units. For the phonological unit (or the "phoneme") is recognized as an elemental unit of communication, and communication is an important orienting principle for phonological analysis.

There are some other distinguishing characteristics of the phonological grid that set it apart from the phonemic inventory; they will be taken up, when we comment on the phonological grid of Deccani Urdu in Chapter I.

Section C5: Substance and Value in Phonological Analysis

The last quarter of the nineteenth century was an era of diametrically opposed views with regard to "substance" and "value" in linguistic analysis. The Neo-grammarians generally neglected value and emphasized the importance of substance in their monumental works on the Indo-European and historical linguistics. As a reaction to this, Ferdinand de Saussure highlighted the importance of value at the expense

of substance, particularly in his lectures, published posthumously as Cours de linguistique générale in 1916.

It was Andre Martinet who first talked of weighing substance and value on equal scales. Following this noted French scholar, Columbia school theory gives equal weight to both substance and value in linguistic analysis.

As we have noted in section C4 above, the phonological units are not isolated, individual entities that are grouped together for ease of reference. Rather, the phonological units are interrelated to one another in the network of the grid. In the saussurean framework, the value may be defined as the interrelationship of linguistic units. In phonology, therefore, the interrelationship of phonological units in the grid may be called the value of these units. However, for the Columbia school phonologists the phonetic substance of the phonological units, determined by the physiologico-acoustic factors, is equally important for the success of phonological analysis.

Section C6: Syntagmatic *versus* Paradigmatic Relations in Phonology

An ingenious scholar and original thinker, Ferdinand de Saussure is credited for introducing many concepts of lasting relevance in linguistics, and is rightfully known as the "father of modern linguistics". Thus it was Saussure, who introduced the dichotomy of syntagmatic *versus* associative relations for

linguistic analysis, with particular reference to grammar and lexicon. Afterwards, the Prague school phonologists, especially N. S. Trubetzkoy, applied this dichotomy to phonological analysis. However, in place of associative relationship, Trubetzkoy introduced the term paradigmatic relationship that appropriately refers to the phonological paradigm.

Following Trubetzkoy, combinatory characteristics in the linear organization of phonological units (or phonemes) are studied under the syntagmatic relations, whereas the interrelationships of these units in the phonological paradigm are dealt with under the paradigmatic relations. And as we have characterized the phonological grid in sections C4 and C5 above, it (the grid) constitutes the phonological paradigm of a language.

The syntagmatic *versus* paradigmatic dichotomy is very important for the phonological analysis in terms of the Columbia school theory. Thus, we will fully deal with both the paradigmatic make-up of the phonological units in the grid, and the syntagmatic organization of these units in the formation of words, as we present the phonology of Deccani Urdu in this thesis.

Section C7: Validation of the Analysis

The postulated phonological units which make up the grid and form the morphemes and words of a language are the

result of the analysis carried out on the basis of the observed data on the one hand, and in terms of the motivating principles (communication, physiology etc.) on the other. The procedure of validating the hypothesized phonological units, both in the paradigm and in the syntagmatic organization of the word, is, in principle, the reverse of the analytical procedure. That is, we prove that what we have hypothesized, is fully justified in terms of the quintuple orienting principles of phonology, and that it provides a close fit with the observed phenomena. In practice, both procedures (analysis and validation) go hand in hand, though it is only the validated analysis that is presented as the finished product.

In validating a phonological analysis, we particularly look for skewings. For they are readily observable, both in the formation of units in the phonological paradigm and in their frequencies of occurrence in the word. As a matter of fact, the frequency counts provide reinforcement, through statistical support, to the validity of the phonological analysis. For the point of validation is a demonstration that the skewings are produced by the interaction of the orienting principles themselves.

Section D: Scope of the Study

In this thesis, we present an explanatory phonology of Deccani Urdu as spoken in the City of Hyderabad. As outlined in the previous section, the explanation of the phonological

analysis is carried out in terms of communication, physiology of the vocal tract, acoustic medium, human behavior, and vision--the independently known and verifiable orienting (phonological) principles of the Columbia school of linguistics. In fact, one chapter each is devoted to the quintuple orientations with a view to explaining the particular, "substantive" characteristics of the phonological units, the make-up of these units in the phonological paradigm, and the manner in which they combine in building up the inventory of lexical morphemes in Deccani Urdu.

A significant portion of research presented in the thesis is devoted to providing a motivated rationale, in terms of the orienting principles, for the paradigmatic asymmetries and the syntagmatic skewings encountered in the phonology of Deccani Urdu. This is mainly accomplished by presenting frequency counts for statistical support in the thesis.

However, it may be noted that the phonological analysis of Deccani Urdu, as presented in the thesis, is limited in three ways:

(1) Whereas both monosyllabic and longer words have extensively been utilized for illustrative examples throughout the thesis, and for contrast in word initial, medial, and final positions in the chapter on the communicative orientation of the language, the frequency counts used for the quantitative support of the analysis, are based on an exhaustive

(complete) collection of only the monosyllabic words of Deccani Urdu. A select but exhaustive collection of disyllabic and longer words, dealing with a particular facet of life in the speech community, will be added when the present research is prepared for publication.

(2) Only some select aspects of the five orienting principles that have a profound impact on the Deccani Urdu phonology, have been treated in the present research. Some other important phonological aspects of Deccani Urdu may be added to the present work, when it is prepared for publication.

(3) In the case of acoustic medium, it must be pointed out that any experimental, acoustic work is beyond the scope of the present research. Our analysis here is therefore based on the updated but secondary sources rather than on original research. There is no reason, however, that original acoustic research could not be undertaken at some future time for additional reinforcement of the phonological analysis presented in this thesis.

CHAPTER I
PHYSIOLOGICAL BASE OF THE DECCANI URDU PHONOLOGY

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In this chapter, we provide an explanation in terms of physiological mechanism as an orienting principle, for the paradigmatic make-up and the syntagmatic distribution of the phonological units (the "phonemes") in Deccani Urdu, as spoken in the old city of Hyderabad. As outlined in the theoretical background in the Introduction, the articulators and the apertures are the basic physiological parameters for the classification of phonological units of a language or a dialect. All phonological units, both consonantal and vocalic, are projected on the relevant intersections of the articulators and the apertures to form the network of these units, which is formally termed the phonological grid ("phonemic inventory"). It is noteworthy that the organization of the phonological units in the grid is not uniform; we find that there are clear skewings in the formation of the phonological paradigm in Deccani Urdu. We also find that the phonological units do not combine arbitrarily to form morphones and words; there are clear skewings of phonological units in the syntagmatic make-up of the word in Deccani Urdu. All these paradigmatic and combinatory asymmetries of the phonological units of Deccani

Urdu are here explained in terms of physiological mechanism as an orienting principle.

An important theoretical difference between Columbia school phonology and American descriptive phonemics should be made clear here. In traditional phonemics, the physiological classification of speech sounds is treated as a non-linguistic level under articulatory phonetics. But in the present analysis, physiological mechanism is a problem solving device (an orienting principle) that provides a motivated rationale for the particular substantive make-up of the phonological units and the interrelationships of these units in the organization of the phonological grid and in the formation of morphemes and words, in Deccani Urdu, as in any other language.

The present chapter has four sections. In section A, we present and justify the paradigmatic make-up of the phonological units--the phonological grid--of Deccani Urdu. In section B, we evaluate the impact of the hierarchy of adroitness of articulators on the paradigmatic make-up and the syntagmatic distribution of consonantal units. In section C, we discuss the physiological motivation of the medium-dorsum mass as the articulator for vowels. In section D, we present the summary with concluding remarks on the physiological base of Deccani Urdu.

Section A: The Phonological Grid of Deccani Urdu

It may be noted that the phonological grid (paradigmatic make-up of the phonological units) of Deccani Urdu, as that of any other language, is motivated by four orienting principles, namely, physiological mechanism, communication, human behavior and acoustic medium. But of these four principles, only two, namely, physiology and communication, play a major role in the formation of the phonological grid. Whereas it is through communication that we establish the phonological units ("phonemes") of a language or a dialect by contrast through minimal and subminimal pairs, these units are appropriately placed on the intersections of the relevant axes of the articulators and apertures on the basis of their substantive characteristics in terms of physiological mechanism. Thus, by way of our principle of communication, we establish the "phonemic inventory" of Deccani Urdu, comprising 56 "phonemes". It may be noted that the number of phonological units established for Deccani Urdu is actually 60, comprising 56 "phonemes" and 4 "positional variants". (For details, cf. Diagram I-1, comments below and Chapter III, section A.) However, it is the projection of all the 60 phonological units on the phonological paradigm of Deccani Urdu as motivated by the physiology of the vocal tract, that is dealt with here.

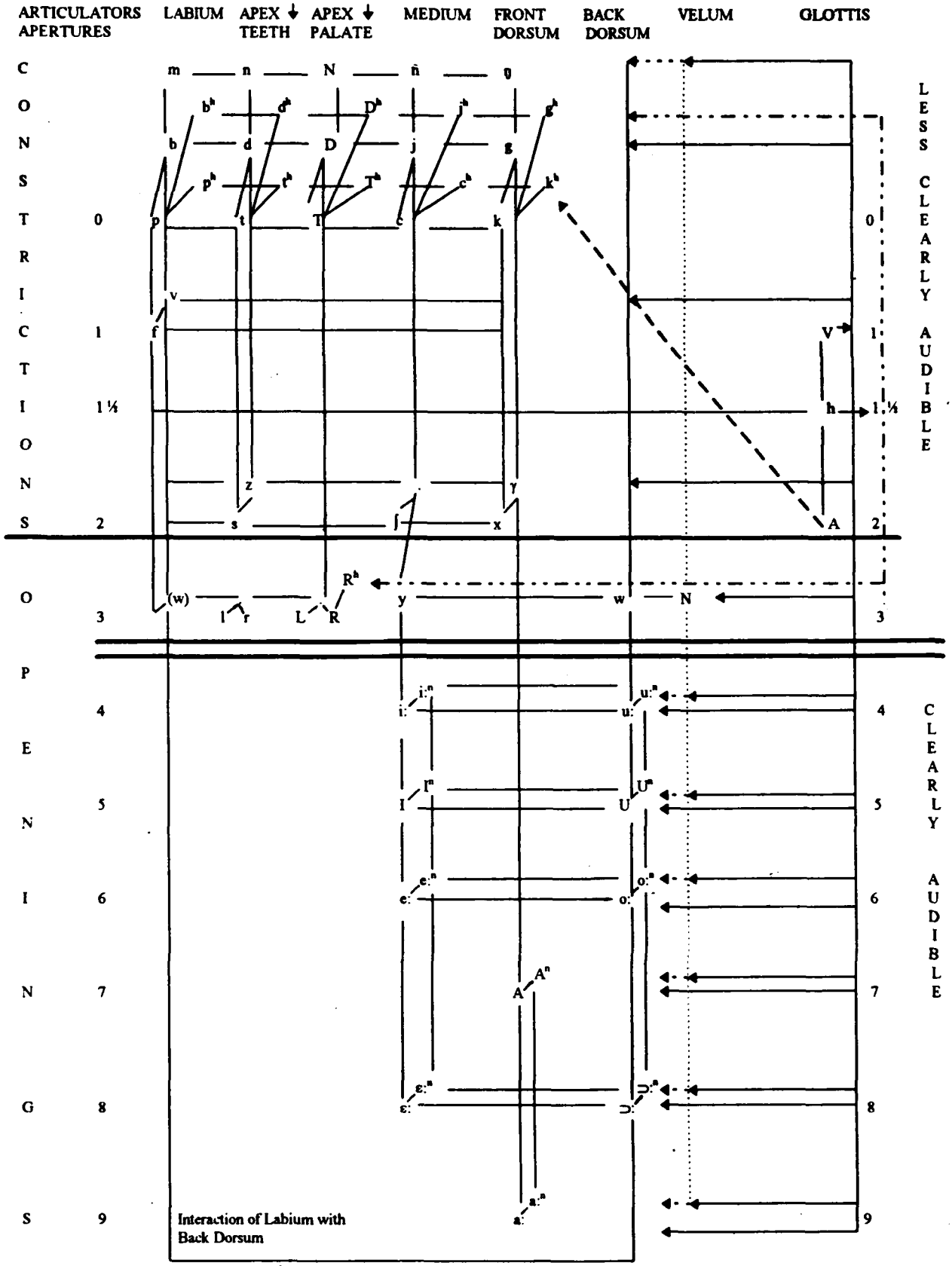

Diagram I-1: The Phonological Grid of the Deccani Urdu of Hyderabad

Of the 60 phonological units established for Deccani Urdu, 40 are consonantal and 20 vocalic. The 40 consonantal units may traditionally be classified into 20 stops, 5 nasals, 8 fricatives, and 7 liquids. The 20 vocalic units are traditionally classified into 14 long vowels (7 oral and 7 nasal), and 6 short vowels (3 oral and 3 nasal). The phonological grid of Deccani Urdu, with the projection of all the 60 units on the appropriate intersections, is presented in Diagram I-1.

Comments on the Phonological Grid of Deccani Urdu

1. **Mechanics of Diagraming**

As shown in the phonological grid above, the paradigmatic relationships of the phonological units are indicated by the network of black solid lines drawn in terms of articulators and apertures.

It may be noted that three highly abstract units of V(oicing), A(spiration), and N(asality), are produced at glottal apertures 1 and 2, and the nasal aperture 3, respectively. These three units are superimposed on many phonological units in the grid. As indicated by the solid lines, the V is superimposed over voiceless unaspirated stops (p t k etc.) and the voiceless fricatives (f s x etc.), to produce their voiced counterparts (b d g etc. and v z γ etc.). The V is also superimposed as a necessary concomitant over all the phonological units produced at aperture 3 (the "liquids") and above (the "vowels"). As shown by the dashes, the A, i.e., the

voiceless aspiration is superimposed on the voiceless unaspirated stops (p t k etc.) to produce voiceless aspirates (p^h t^h k^h etc.). Finally, the superimposition of N over the voiced unaspirated stops (b d g etc.) to produce their nasal counterparts (m n ŋ etc.), is indicated by the dotted lines. As the dotted lines indicate, the N is also superimposed on the oral vowels (i: a: u: etc.), to produce their nasal counterparts ($i:^n$ $a:^n$ $u:^n$ etc.).

As indicated by the dashes and dots, the glottal unit h (the voiced aspiration) is superimposed on the simple stops (p t k etc.) and the liquid R, to produce the highly complex voiced aspirates (b^h d^h g^h etc.) and the aspirated liquid R^h.

The interaction of two articulators, namely, the labium and the back dorsum, is indicated by solid black lines with arrows. For both these articulators jointly produce the semivowel w and the "back rounded" vowels (u: U o: etc.) in Deccani Urdu.

The apertures may be classified into two broad divisions, namely, Constriction *versus* Opening, and Clearly Audible *versus* Less Clearly Audible. The constriction apertures (∅ through 2) are set apart from the opening apertures (3 through 9) by the bold double solid lines. The bold solid line indicates the division of apertures in terms of audibility. Apertures ∅ through 3 are recongnized as less

clearly audible, whereas apertures 4 and above are regarded as clearly audible.

2. Articulators and Apertures

Articulators and apertures are the two basic physiological parameters for the classification of phonological units of a language or a dialect. Articulators are the adroit members of the vocal organs that are placed horizontally along the vocal tract, whereas apertures are the various degrees of vertical openings of the oral cavity that are brought about by the movement of the lower jaw.

As seen in the phonological grid of Deccani Urdu (Diagram I-1), the phonological units in the paradigm are produced by combining articulators, singly or in combination, with degrees of aperture. The articulators for Deccani Urdu are the lower lip, the apex of the tongue, the medium of the tongue, the dorsum of the tongue, the velum (that opens the nasal cavity), and the larynx. The degrees of aperture are: ∅--complete stoppage; 1--partial stoppage, so that air is forced between the articulator and the place of articulation, they are in contact; 2--no stoppage, but the air forming a sufficiently small aperture that it can control the stream of air coming from the lungs (noise is produced by turbulence as the air stream comes in contact with some target); 3, 4, 5, 6, 7, 8, and 9--the articulator used to produce resonant cavities with

successively larger degrees of aperture. (For further details, cf. Introduction: theoretical background.)

3. **Constriction *versus* Opening**

As shown in the phonological grid of Deccani Urdu (Diagram I-1), a broad division of apertures is based on the distinction of constriction (apertures ∅ through 2) *versus* opening (apertures 3 through 9). The distinction of constriction *versus* opening apertures is based on both physiology of the vocal tract and the acoustic medium.

The phonological units produced at constriction apertures include 20 stops, 5 nasals, and 8 fricatives. The phonological units articulated at the opening apertures comprise the 7 "liquids" and all the 20 vowels of Deccani Urdu.

As pointed out in the theoretical background in the Introduction, the phonological units at the constriction apertures--∅, 1, 1½ and 2--are produced through a narrow passage between articulators and the associated places of articulation. As a result, the supraglottal articulators both shape and excite the oral cavity in the production of consonantal units at these apertures. It may however be noted that the simultaneous addition of the glottal articulation, through voicing or aspiration, makes the voiced and the aspirated consonantal units more complex at these apertures.

For example, b d g or v z γ are more complex than p t k or f s x.

Finally, it may be noted that due to the close contact between the articulators and the places of articulation through the very narrow passage in the production of the "stops" and the "fricatives", the constriction apertures can be measured in absolute terms.

In contradistinction to constriction apertures (∅ through 2), the larger apertures (3 and above) are termed opening apertures. As the distance between the articulators and the associated places of articulation increases, in the production of phonological units at these apertures, the articulators can only shape the cavity and the excitation has to be provided by the larynx, through voicing, by setting the edges of the vocal folds in vibration. Thus, voicing becomes a necessary concomitant for the production of phonological units at these apertures.

Furthermore, unlike the absolutely defined constriction apertures (∅ through 2), the opening apertures (3 through 9) can only be defined in relative terms. For the distances between the degrees of aperture are relative and they vary from language to language to conform to the differing vocalic systems. (For further details, see section C below.)

4. Clearly Audible versus Less Clearly Audible

As seen in the phonological grid of Deccani Urdu (Diagram I-1), there is another broad division of apertures, namely, the clearly audible (apertures 4 through 9) *versus* the less clearly audible (apertures ∅ through 3), based on the acoustic medium. For only at apertures 4 and above, with the appropriate shaping of the vocal tract and with no impediment of the air flow coming from the lungs, can we produce the clearly audible phonological units of our language. On the contrary, the less clearly audible units are produced at aperture ∅ through 3, by impeding to a greater or lesser degree the air flow by the supraglottal articulators. This distinction in terms of audibility provides a basic classification of phonological units into the vocalic units ("vowels") and the consonantal units ("consonants") for Deccani Urdu, as for any other language. (For further details, cf. Chapter V, section A.)

5. Phonemes *versus* Phonological Units

As it will be seen in Chapter III, the phonemes of a language are motivated by communication and can therefore be established by contrast through minimal and subminimal pairs. All the phonemes thus established are then appropriately placed, in terms of their physiologico-acoustic make-up, in the paradigmatic network of the phonological grid (Diagram I-1). When the communicatively based phonemes of a language are interrelated to one another in terms of their

physiologico-acoustic base in the grid, they may be called phonological units. It may however be noted that the number of phonological units for a language is slightly higher than the number of phonemes for that language. For a few positional variants of some of the phonemes, may, in terms of their phonetic substance, fall on the relevant intersections of the articulators and the apertures. These positional variants are also elevated to the status of phonological units.

Thus, of the 60 phonological units postulated for Deccani Urdu, as seen in Diagram I-1, 56 units are communicatively based "phonemes", and only 4 units, namely, L, R^h, N, ñ, are positional variants.

6. The Status of V A and N as Phonological Units

Like all other phonological units, V(oicing), A(spiration), and N(asality) are also produced by the combination of articulators and apertures. Thus, V(oicing) is produced by the glottal articulator at aperture 1. Further, A(spiration) is generated by the glottal articulator at aperture 2, and N(asality) is produced by the velum as an articulator at aperture 3.

The phonological units of V, A, and N, as shown in Diagram I-1, are set apart from other phonological units in that they do not appear as individual, independent units in the speech chain or written text. But these three special units are required, for they are superimposed on certain other, simpler

classes of phonological units (consonantal or vocalic), to produce relatively more complex units in terms of physiology and acoustics. In this way, V, A, and N represent a higher degree of abstraction as compared to other phonological units.

7. The Production of N(asality)

As pointed out in the comment above, N(asality) is produced by the velum as an articulator at nasal aperture 3 (Diagram I-1).

As noted earlier in comment 3, V(oicing) is essentially required to bring about excitation of the vocal cavity in the production of supraglottal phonological units at the oral apertures 3 and above. It is noteworthy that V(oicing) is also equally essential in the production of all nasal units, both consonantal and vocalic, formed at oral apertures ∅ and 4 through 9, in combination with N(asality) at nasal aperture 3. For V(oicing) is a necessary concomitant for the production of N(asality), as the nasal cavity is opened to aperture 3 by the velum as an articulator.

As shown in Diagram I-1, N(asailty) is superimposed on the voiced stops (b d g, etc.) to produce nasal consonants (m n ŋ etc.). As such, the nasal consonants seem to be more complex in terms of physiology and acoustics than the corresponding (oral) voiced stops. But as V(oicing) is a necessary concomitant for the production of the nasal

consonants, these consonants may be considered on a par with the voiced stops in terms of complexity.

It is noteworthy that V(oice) is also required in the production of both the oral vowels and the nasal vowels. However, as the oral vowels have already made an investment in V(oice), the superimposition of N(asality) brings about an added physiologico-acoustic complication in the production of the opposing nasal vowels. We therefore expect that the nasal vowels should be disfavored *vis-a-vis* the oral vowels.

As seen in the Diagram, there is a parity in terms of the number of units between the oral vowels and the nasal vowels in Deccani Urdu. However, as will be seen in Chapter II, section A, the disfavoring for the nasal vocalic units, *vis-a-vis*, the corresponding oral vocalic units, is clearly manifest in the frequency of their usage in the word.

8. Units Formed at Two Places of Articulation with the Same Articulator: Apico-Dentals *versus* Apico-Palatals

As seen in the phonological grid of Deccani Urdu (Diagram I-1), the apex as an articulator combines with two distinctly different places of articulation, namely, the teeth and the palate, to produce two sets of phonological units--the apico-dental and the apico-palatal. The apico-dental (the traditional "dental") consonantal units--t t^h d d^h l n s r--are produced, when the apex comes in contact with the teeth. Likewise, the apico-palatal (the traditional "retroflex")

consonantal units –T T^h D D^h L N R R^h--are formed when the apex comes in contact with the palate.

To be sure, the production of two sets of consonantal units by the apex as an articulator is not a mere coincidence. For the apex is the most adriot among all the supraglottal articulators. (For details, cf. section B below.)

9. Units Formed with Two Articulators: The Labio-Dorsals

Some of the phonological units in Urdu, as in many other languages, are produced jointly by two articulators, viz., the back dorsum and the labium. Thus, both labium and back dorsum simultaneously act as articulators, to produce the "semivowel" w at aperture 3, and the "back rounded" vowels--u: $u:^n$ U U^n o: $o:^n$ ɔ: $ɔ:^n$--at apertures 4 and above, in the Deccani dialect of Urdu.

Finally, it may be noted that it is not coincidental that the labium is used as an additional articulator to produce the lip rounding in the formation of the back rounded vowels. The role of the labium in the production of these vowels, is taken up in Chapter V: Acoustic Base of Deccani Urdu Phonology.

10. The Production of V, A, and the voiced h[2]

As seen in Diagram I-1 , these three glottal units,

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[2] For the glottal dynamics in the production of the voiceless h and the voiceless aspirates *versus* the voiced h and the voiced aspirates, we have benefited through personal communication from Professor R. Prakash Dixit, the noted scholar of experimental phonetics at the Louisiana State University, Baton Rouge, Louisiana.

namely, V(oicing), A(spiration) and the voiced h, are produced by the glottal articulator in combination with apertures 1,2 and 1½ respectively. The glottal configurations for the production of these three phonological units are shown in Diagram I-2.

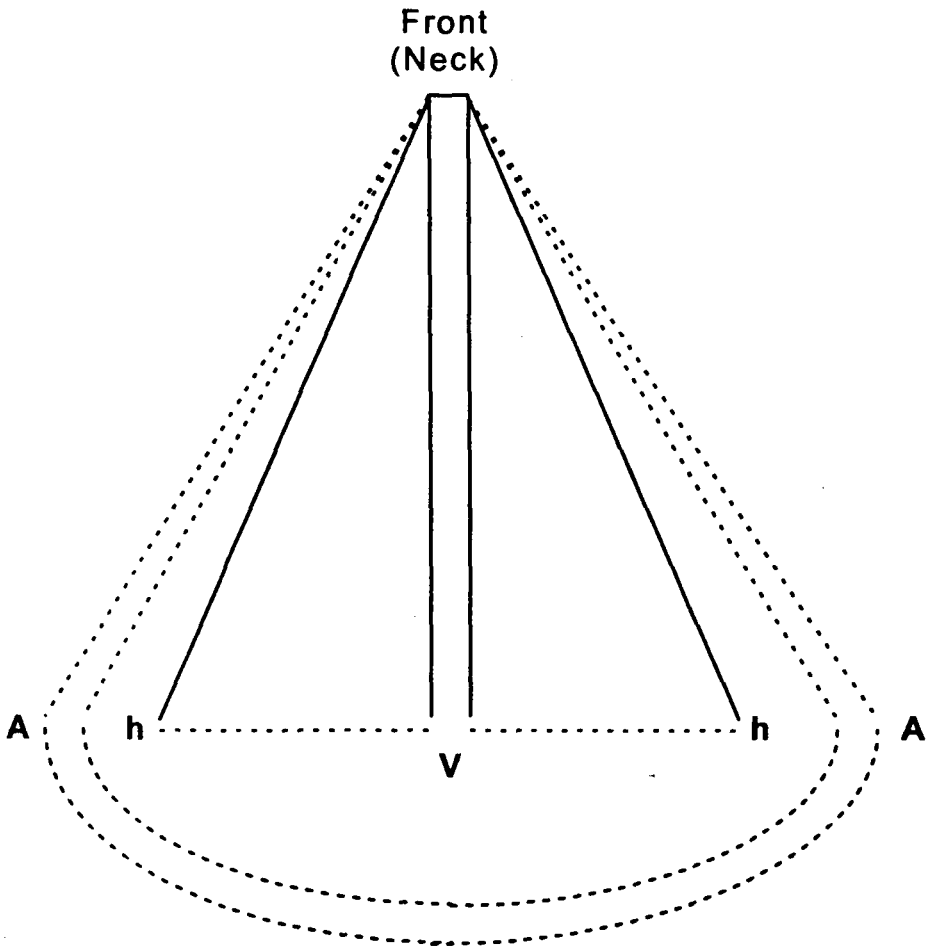

Diagram I-2: Configurations of the Vocal Folds in the Production of V, A, and the voiced h.

Whereas the phonological grid, as shown in Diagram I-1, is an overview of the entire phonological paradigm, it may be noted that Diagram I-2 presents an excerpt of the phonological grid, highlighting the characteristic glottal

configurations in the production of V, A, and the voiced h in Deccani Urdu. Therefore, it is mainly with reference to this diagram that we characterize the make-up of these three special units, and their role in the production of other, supraglottal units.

Comments on Diagram I-2:

(a) V(oicing): In the production of V, the vocal folds form a narrow slit at glottal aperture 1, as seen in the Diagram above. As the air stream coming from the lungs is forced through this narrow slit, it sets the edges of the vocal folds in vibration, producing the musical tone technically known as "voice".

Although it is not used as an individual unit by itself, the V(oicing) is a necessary concomitant for the production of the vocalic units and some consonantal units (the "liquids" and the "nasals") in Deccani Urdu, as in almost all the languages of the world. Further, V is superimposed on simple stops (p t k, etc.) and fricatives (f s x, etc.) to produce the more complex voiced stops (b d g, etc.) and voiced fricatives (v z γ, etc.).

(b) A(spiration): As seen in Diagram I-2, the vocal folds assume a wide triangular configuration in the production of A (or the voiceless h) at glottal aperture 2. The lungs provide sufficient air to push through this relatively large glottal opening. Whereas A (or the voiceless h) appears as an individual, independent unit in many languages of the world, it

is noteworthy that this unit does not occur independently in Urdu, including Deccani Urdu. As a highly abstract unit, A(spiration) is superimposed on simpler phonological units (such as p t k, etc.) to produce relatively more complex units (such as p^h t^h k^h, etc.).

(c)The voiced h: In the formation of the voiced h at glottal aperture 1½, as seen in Diagram I-2, the vocal folds form a narrow trigangular configuration. This narrow triangle is exactly half the size of the wider triangle that is formed in the production of the voiceless h at aperture 2.

In view of the extraordinary glottal configurations, the production of the voiced h becomes highly complex. But it is noteworthy that this physiologico-acoustically most complex glottal unit occur as an independent unit in the speech chain (or the written text) in Urdu, including Deccani Urdu, as in some other Indo-Aryan languages.

Further, this voiced h is superimposed on the simple phonological units, such as p t k etc., to produce the physiologico-acoustically most complex supraglottal units, such as b^h d^h g^h etc., in Urdu and its dialects, as well as in some other Indo-Aryan languages.

Section B: The Hierarchy of Adroitness of Articulators: The Make-up and Distribution of Consonantal Units

As discussed in the Introduction: the theoretical background (Section C2(b)(v)), the relative adroitness of the various lingual articulators (the apex, the dorsum, the medium, the post-dorsum) is directly related to their physiological musculature. On that basis, the scale of adroitness of lingual articulators was set up in Diagram 0-1. As seen in that diagram, the apex of the tongue holds the top position in the hierarchy of adroitness among the lingual articulators, followed by the dorsum, the medium, and the post-dorsum (or the root), in that order. It may be recalled that we also made a *de facto* placement of the labium, somewhere near the dorsum of the tongue, on the scale of adroitness for the supraglottal articulators. For interms of adroitness, the labium, with its flexible muscles, falls certainly below the apex and above the medium.

It is noteworthy that the impact of the hierarchy of adroitness of articulators is limited only to the consonantal units ("stops", "fricatives", "liquids", and "nasals"), which are produced at the less clearly audible apertures (∅ through 3). Parenthetically, it may be pointed out that a different dissection of the tongue, based on the size, shape, and mass, is required to provide the physiologico-acoustic rationale for

the production of the vocalic units, which are produced at the clearly audible apertures (4 through 9). For details, see section C on the medium-dorsum mass below.

The relative adroitness of articulators has an impact on the paradigmatic make-up and the syntagmatic distribution of the phonological units in Deccani Urdu, as in any other language or dialect. It is noteworthy that the apex is the most adroit articulator among all the supraglottal (including lingual) articulators..That is why, the apex can freely move across the length and breadth of the entire oral cavity. What is important from our viewpoint is the fact that this highly adroit articulator can come in contact with more than one places of articulation in the formation of consonantal units in many Indian languages. Thus, we have two orders of consonantal units, the apico-dental ("dental") and the apico-palatal ("retroflex") in Deccani Urdu. In contradistinction to the apex, the other lingual articulators are less flexible. Therefore, they generally come in contact with their nearest places of articulation. That is why, we have only one order of consonantal units each for the dorsal, and the medial articulators in Deccani Urdu. And it is not coincidental that whereas the post dorsal axis is marginally employed for only the production of q in modern standard Urdu, the least adroit post dorsum (or the root) is not used at all as an articulator in the Deccani dialect of Urdu studied here.

In veiw of the apex being the most adroit among the lingual and all other supraglottal articulators, we expect that there will be a vast skewing in the number of units and their frequency of usage, in favor of the apical consonants, *vis-a-vis* the number of units and the frequency of their occurrence produced by the other supraglottal articulators.

Further, within the consotnatal units produced by other lingual articulators, we expect that the dorsal consonants formed by the more adroit dorsum, will be preferred over the medial consonants formed by the less adroit medium. And, as we have noted above, there is a <u>total</u> skewing against the post-dorsal units formed by the least adroit post-dorsum in Deccani Urdu, whereas only one post-dorsal unit, namely q, occurs in modern standard Urdu.

It will be generally agreed that the labium as an articulator may be close to the dorsum in terms of the adroitness. We therefore expect that the labial consonants may compete well with the dorsal consonants in terms of the number of units, and their frequencies of usage in the word in Deccani Urdu.

In the light of our discussion above, we gauge, in section B1, the impact of the hierarchy of adroitness of articulators on the number of consonantal units in the phonolgoical grid of Deccani Urdu. In section B2, we examine the impact of the hierarchy of adroitness on the frequency of

occurrence of these units in the formation of words in the Deccani dialect of Urdu.

Section B1: Impact of the Hierarchy of Adroitness of Articulators on the Number of Consonantal Units in the Paradigm

In terms of the scale of adroitness of articulators (Diagram 0-1), we expect the apical consonants to be most favored, followed by the dorsal or labial, the medial, and the post-dorsal consonants, in that order.

With a view to establishing the validity of our postulation, we present the paradigmatic make-up of the consonantal units of Deccani Urud, in Table I-1.

Articulators / Apertures		Apex ↙ Teeth	Apex ↘ Palate	Labium	Dorsum	Medium	Post-Dorsum	Total
Oral	Nasal							
		t	T	P	k	c		
Ø	Ø	d	D	b	g	j		
		t^h	T^h	p^h	k^h	c^h		
		d^h	D^h	b^h	g^h	j^h		20
Ø	3	n	N	m	ŋ	ñ		5
1	Ø			f				
				v				2
2	Ø	s			x	ʃ		5
		z			ɣ			
3	Ø	l r	L R R^h	w	w	y		8
Total		9	17 8	8	8	7	0	40

Table I-1: Hierarchy of the Adroitness of Articulators and the Make-up of the Consontal Units

Comments on Table I-1:

Comment 1: As seen in this table, of the 40 consonantal units in Deccani Urdu, the apex produces 17 units (apcio-dental 9 and apico-palatal 8), the dorsum 8, the labium 8 and the medium 7. Inasmuch as the labio-dorsal units w is simultaneously produced by two articulators--the labium and the dorsum--is unit is counted both as labial and as dorsal in the table. Further, it may be noted that there is no consonantal unit at the post-dorsal axis in Deccani Urdu.

As argued below, the above distribution of the consonantal units in the phonological paradigm of Deccani Urdu unit is perfectly in conformity with our expectations in terms of the scale of adroitness of articulators.

Comment 2: It is noteworthy that the apical consonants (17) appear in a ratio of over 2 to 1 the dorsal consonants (8) and the labial consonants (8). This rather drastic tilt in favor of the apical consonants and against the dorsal and the labial consonants, is fully justified in view of the extraordinary adroitness of the apex. In fact, as pointed out earlier, the apex, as the most adroit supraglottal articulator, comes in contact with two places of articulation--the teeth and the palate--to produce two orders of consonants, namely, the apico-dental ("dental") and the apico-palatal ("retroflex"), in Deccani Urdu, as in some other Indian languages.

Comment 3: As noted earlier, the labium is closer to the dorsum in terms of the adroitness of articulators. As seen in Table I-1, there is a parity in the number of units, 8 each, produced by the dorsum and the labium. This parity in the number of units for the two articulators is perfectly in conformity with our expectation.

Comment 4: As shown in the table, the medium of the tongue as a less adroit articulator produces 7 consonantal units in Deccani Urdu, and this lower figure for the medial ("palatal") consonants is compatible with our hierarchy of adroitness postulation.

Comment 5: As noted earlier, the post-dorsum of the tongue is the least adroit among the lingual articulators. It is therefore not coincidental that this articulator does not form any unit in Deccani Urdu. To be sure, the consonant q produced by the post-dorsum did exist in old Urdu and has been preserved in classical Urdu, as well as in modern standard Urdu. However, the post-dorsal q of old Urdu was lost in Deccani Urdu, and was merged with the dorsal x.

Section B2: Impact of the Hierarchy of Adroitness of Articulators on the Frequency of Occurrence of the Consonantal Units.

We now evaluate the impact of the hierarchy of adroitness of articulators on the syntagmatic usage of consonantal units in Deccani Urdu. As stated earlier, we

expect the apical units to be most favored in their frequency of usage, followed by the dorsals or labials, and the medial consonants, in that order. With a view to providing quantitative support in favor of our predictions, we present the frequency counts for the four types of consonants in Deccani Urdu in four subsections below.

In section B2(a), we examine the impact of the hierarchy of the adroitness of articulators in the syntagmatic distribution of the consonantal units in their entirety. In section B2(b), B2(c), and B2(d), we gauge the impact of this hierarchy on the frequency of occurrence for the "stops", the "nasals", and the "liquids", respectively.

Section B2(a): Syntagmatic Distribution of the Consonantal Units in Terms of the Hierarchy of Adroitness of Articulators.

In this section, we evaluate the impact of the hierarchy of the adroitness of articulators on the distribution of the apical, the labial, the dorsal, and the medial consonants in the formation of the word in Deccani Urdu. The actual occurrences of the opposing consonantal types, as they appear in the monosyllabic words, are presented in Table I-2.

Consonantal Units Apertures Ø,1,2,3	CVC words		CVCC words		CCVC words		Total	
Articulators	No	%	No.	%	No.	%	No.	%
Apex-Teeth	1080	38.08	226	43.29	7	31.82	1313	38.84
Apex-Palate	335	11.81	31	5.94	-	-	366	10.83
Apex	1415	49.89	257	49.23	7	31.82	1679	49.67
Labium	583	20.56	86	16.48	6	27.27	675	19.97
Dorsum	476	16.79	125	23.95	4	18.18	605	17.90
Medium	362	12.76	54	10.34	5	22.73	421	12.46
Total	2836	100	522	100	22	100	3380	100

Table I-2: Frequency of the Consonantal Units in the Monosyllabic Words in Terms of Articulators

Comments on Table I-2

Comment 1: As seen in the last column for the monosyllabic words in Table I-2, the apex alone produces nearly half (1679) of the total number of occurrences (3380) for all the four consonantal types combined. This vast skewing in favor of the apical consonants is brought about by the extraordinary mobility of the apex as an articulator.

Of these 1679 apical occurrences, 1313 occurrences are apico-dental ("dental"), and only 366 occurrences are apico-palatal ("retroflex"). That is, the apico-palatal occurrences appear in a ratio of almost 1 to 4 the apico-dental occurrences. This skewing against the apico-palatal and in favor of the apico-dental, is taken up in Chapter II, section B.

Although they are left far behind in the frequency of usage as compared to the apical consonants, both the labial and the dorsal consonants, with 675 and 605 occurrences respectively, compete well with each other in their usage in the word. This close competition between the dorsals and the labials is perfectly justified in view of the parallel placement of labium and dorsum on the scale of adroitness of articulators.

Further, as seen in the last column, the medial consonants are the least frequent of all the four types of consonants. It is notworthy that the medial consonants (421) appear in a ratio of almost 1 to 1½ the dorsal consonants (605) and the labial consonants (675). Thus, whereas in terms of the number of units, the medial consonants (7) are only slightly disfavored as compared to the dorsal consonants (8), and the labial consonants (8), the skewing against the medials becomes much more sharp *vis-a-vis* the dorsals and the labials, in their frequency of usage in the word. This low frequency of usage for the medial consonants is fully justified in view of the scale relationship.

Comment 2: As seen in the CVC column in Table I-2, of the 2836 consonantal occurrences appearing in the syntagmatically simple CVC words, 1415 occurrences are apical, 583 labial, 476 dorsal, and 362 medial. As these figures show, the number of occurrences decline as we move

down from the most adroit apex to the less adroit medium. As a matter of fact, with minor variations, these figures appear in the same ratios, as those seen for all the monosyllabic words combined in comment 1 above. That is, the frequency of occurrence for the apical, dorsal, labial, and medial consonants in the CVC words fully conforms to our predictions in terms of the hierarchy of adroitness of supraglottal articulators.

Comment 3: As shown in the CVCC column in the table, the figures for the apical consonants (257), dorsal consonants (125), labial consonants (86), and the medial consonants (54) also conform to our expectations in terms of the scale of adroitness. To be sure, there is a substantial increase in the frequency of occurrence for the dorsals (125) *vis-a-vis* the labials (86). (Parenthetically, it may be noted that this skewing in the frequency of usage may be due to the syntagmatic complexity of the CVCC words, with a final consonant cluster.) However, it is important to note that even here the labials are competing well with the dorsals, and the figures for both the dorsal and the labial consonants do fall between the highly favored apicals (257) and the disfavored medials (54).

Comment 4: As seen in the column for the CCVC words in Table I-2, of the 22 consonantal occurrences in these words, 7 are apical, 6 labial, 4 dorsal, and 5 medial. Here, the figures

for the dorsals and the medials are against our expectation in terms of the scale relationship. An explanation of this discrepancy is provided below.

Firstly, there are only 7 words in Deccani Urdu with an initial consonant cluster. Further, the second consonant of this cluster is limited to only y or w. Thus, of the 7 CCVC words, 5 words, such as kya: 'what', contain y as the second member of the cluster, and these are the only 5 occurrences of the medial consonants that appear in these words. Not a single occurrence of the disfavored medial consonants appears in the first position of this consonant cluster.

Secondly, it may be noted that both the number of CCVC words (7), and the total number of occurrences (22), are statistically insignificant for validating the phonolgoical analysis.

Section B2(b): Syntagmatic Distribution of the Stops in Terms of the Hierarchy of Adroitness of Aritcualtors

In this section, we make a comparison of the frequencies for the apical, the labial, the dorsal, and the medial stops with a view to gauging the impact of the hierarchy of adroitness of articulators. We present in Table I-3, the actual occurrences of the opposing stops in the monosyllabic words in Deccani Urdu.

Stops Apertures ∅	CVC words		CVCC words		CCVC words		Total	
Articulators	No	%	No.	%	No.	%	No.	%
Apex-Teeth	301	18.27	67	32.06	2	28.57	370	19.86
Apex-Palate	248	15.06	21	10.05	-	-	269	14.44
Apex	549	33.33	88	42.11	2	28.57	639	34.30
Labium	411	24.96	37	17.70	4	57.14	452	24.26
Dorsum	380	23.07	61	29.19	1	14.29	442	23.72
Medium	307	18.64	23	11.00	-	-	330	17.72
Total	1647	100	209	-	7	100	1863	100

Table I-3: Frequency of the Stops in the Monosyllabic Words in Terms of Articulators

Comments on Table I-3

Comment 1: As seen in the last column in Table I-3, there are 1863 occurrences of stops in all the monosyllabic words of Deccani Urdu. Of all these stop occurrences, the apicals have 639 occurrences, followed by the labials with 452, the dorsals with 442, and the medials with 330. These figures are in complete conformity with our predictions in terms of the hierarchy of adroitness of articulators.

It is noteworthy that the apical stops alone, with 639 occurrences, appear in a ratio of almost 1 to 3 with 1863 occurrences for all four types of stops combined. As discussed earlier, this vast skewing in favor of the occurrences produced by the most adroit apex, is fully justified. (For the drastic

skewing in favor of the apico-dentals and against the apico-palatals, cf. Chapter II, section B.)

Comment 2: As seen in the CVC column in the table above, of a total of 1647 occurrences for all the stops in the CVC words, the apical stops remain on top, with 549 occurrences, followed by the labials with 411 occurrences, the dorsals with 380 occurrences, and the medials with 307 occurrences, in that order. Again, it is worth noting that the apical stops alone appear in a ratio of 1 to 3 with the occurrences for all four types of stops combined.

Parenthetically, it may be noted that of the 549 occurrences of the apical stops, 301, are apico-dental and 248 are apico-palatal. As these figures show, there is a fair competition between the apico-dental and the apico-palatal stops in the frequency of their usage in the CVC words in Deccani Urdu. This competitive usage of the two types of stops in the syntagmatically simple CVC words, is taken up in Chapter II, section B.

The actual occurrences of the four stop types in the CVC words, as presented above, are fully justified by the scale relationship in terms of adroitness of articulators.

Comment 3: As shown in Table I-3, of a total of 209 occurrences in the column for the CVCC words, the figures for the apical stops are 88, the dorsal stops 61, the labial stops 37, and the medial stops 23.

As seen in these figures, there is a drastic skewing in favor of the most adroit apex in these syntagmatically complex CVCC words. For the apicals appear in a ratio of over 2 to 5 with the occurrences of all four types of stops combined in these words. The lowest figure (23 occurrences) for the medial stops, produced by the less adroit medium, are also justified by the scale relationship.

As seen in the table, the frequency of occurrences for the labial stops (37) and the dorsal stops (61), are all right in that both the labial and the dorsal stops are less frequent than the apical stops, and are more frequent than the medial stops. However, it is apparent that rather than a fair competition between the dorsals and the labials, there is a clear skewing in favor of the former and against the latter. This skewed distribution for the dorsal and the labial stops can again be attributed to the complexity of the CVCC words, with a final consonant cluster. It may not be coincidental that of the 61 occurrences for the dorsal stops in the CVCC words, over 40 occurrences of these stops appear as the second member of the consonant cluster after a dorsal nasal (ŋ).

Parethetically, it may be noted that of the 88 occurrences of the apical stops, 67 are apico-dental and 21 are apico-palatal. Unlike their distribution in the CVC words dealt with in comment 2 above, it is clear that the favoring for the preferred apico-dental stops is sharply increased in the

syntagmatically complex CVCC words, whereas the disfavored apico-palatal stops are additionally disfavored in these words. For an explanation of this vast skewing, cf Chapter II, section B.

Comment 4: As shown in the column for the CCVC words in Table I-3, of the 7 occurrences for the four types of stops in these words, the apical stops have 2 occurrences, labial 4, dorsal 1 and medial 0. It may be noted that the figures for the apical and the labial stops are against our pedictions. However, the total number of words (7) and the total number of occurrences (7) for the stops in the CCVC words are not sufficient for a quantitative validation of our analysis in terms of the hierarchy of adroitness of articulators.

Section B2(c): Syntagmatic Distribution of the Nasal Consonants in Terms of the Hierarchy of Adroitness of Articulators

In this section, we measure the impact of the hierarchy of adroitness of articulators on the distribution of nasal consonants in the formation of the word in Deccani Urdu. The actual occurrences of the nasal consonants, as they appear in the monosyllabic words, are presented in Table I-4.

Nasal Consonants Oral Nasal Apertures ∅ 3	CVC words		CVCC words		CCVC words		Total	
Articulators	No	%	No.	%	No.	%	No.	%
Apex-Teeth	167	51.86	26	72.22	1	100	194	45.43
Apex-Palate	0	0	10	27.78	0	0	10	02.35
Apex	167	51.86	36	34.61	1	100	204	47.78
Labium	124	38.50	28	26.92	0	0	152	35.60
Dorsum	31	09.64	34	32.70	0	0	65	15.22
Medium	0	0	6	05.77	0	0	06	01.40
Total	322	100	104	100	1	100	427	100

Table 1-4: Frequency of the Nasals in the Monosyllabic Words in Terms of Articulators

Comments on Table I-4

Comment 1: As seen in the last column in the table above, of 427 occurrences of nasal consonants in all the monosyllabic words in Deccani Urdu, the apex produces 204, the labium 152, the dorsum 65, and the medium 6, in that order. The above figures for the nasal consonants, with the exception of those for the dorsal nasals, are in conformity with our expectation in terms of the hierarchy of adroitness of articulators.

The apical nasals (204), produced by the most adroit apex, comprise almost half of the total number of occurrences (427) in the monosyallbic words. This skewing in favor of the apicals is not a coincidence. For in view of the extraordinary adroitness of the apex, we expect the apical nasals to be

highly favored as compared to the labial, dorsal, and the medial nasals.

Further, within the apicals, we again encounter a vast skewing in favor of the apico-dentals (194) *vis-a-vis* the apico-palatals (10), and this vast preference for the apico-dental nasals is perfectly all right in terms of human behavior as an orienting principle. (For details, cf. Chapter II, section B.)

In terms of the scale relationships, we expect a fair competition between the labial nasal m and the dorsal nasal ŋ. But as seen in the figures in the table, the labials have 152 occurrences and the dorsal only 65. That is, there is a clear preference for the labials *vis-a-vis* the dorsals in the frequency of their occurrence in the monosyllabic words. The rationale for this skewed distribution in the frequency of usage can be seen in the make-up of the labial m and the dorsal ŋ as phonological units. Whereas m as a fulfledged phoneme, may occur in any position of the word, ŋ as a positional variant, can appear only before a dorsal consonant or in word final position. (Cf. Chapter III, section B3.)

Comment 2: The figures in the CVC column in Table I-4, again show that of a total of 322 occurrences for the nasal consonants in the CVC words, the apical nasals with 167 occurrences occupy the top position, followed by the labials with 124, the dorsals with 31, and the medials with 0.

Here again, the apical nasals (167) are vastly favored, for they account for more than half the total number of occurrences for all four nasal types combined (322). And this tilt in favor of the apicals is fully justified in terms of the physiological principle of the adroitness of articulators.

Parenthetically, it may be noted that among the apical nasals, there is a total skewing in favor of the apcio-dentals (167) and against the apcio-palatals (0). This extreme skewing against the apico-palatal ("retroflex") nasals is brought about by two factors. First, as noted above, the "dentals" are preferred over the "retroflex' in terms of human behavior. (Cf. Chapter II, section B.) Second, unlike the apico-dental n, which is fulfledged phoneme, the apico-palatal ("retrofelx") N appears only as a positional variant before a "retroflex" stop in Deccani Urdu (Cf. Chapter III, Section B3.)

As seen in the CVC column in the table above, there is a total skewing against the medial nasal ñ (with 0 occurrence) among the CVC words. Again there are two reasons for this extreme skewing against the medial nasal (ñ). First this nasal is produced by the less adroit medium as an articulator. Second, being a positional variant, ñ can only occur before a stop in Deccani Urud, and therefore there is no scope for its occurrence in the syntagmatically simple CVC words.

Finally, a note on the skewed distribution for the labial nasal m (124) and the dorsal nasal ŋ (31) in the CVC words.

As noted earlier in comment 1, the dorsal nasal ŋ is a positional variant that can appear before another nasal or in word final position. Therefore, in the CVC words dealt with here, this nasal consonant can occur in only word final position. In contradistinction to the dorsal nasal, the labial nasal m appears as a fulfledged phoneme in Deccani Urdu. (Cf. Chapter III, section B3.) Hence, we have the skewed distribution of the labial nasal and the dorsal nasal, as observed here.

Comment 3: As shown in the CVCC column in the table above, of 104 occurrences for all the nasal consonants, the apical nasal retains its top position with 36 occurrences, followed by the dorsal 34, the labial 28, and the medial 6. These figures, for each nasal type, are in complete conformity with our expectations in terms of the hierarchy of adroitness of articulators.

Comment 4: As seen in the CCVC column in the table above, only 1 occurrence is observed for the nasal consonants in the CCVC words. And it is noteworthy that this single occurrence is apical, produced by the most adroit lingual articulator, the apex. The appearance this lone apical nasal in of the CCVC words is fully justified in terms of our physiological criterion of the adrotiness of articulators.

Section B2(d): Syntagmatic Distribution of the Liquids in Terms of the Hierarchy of Adroitness of Articulators

In this section, we assess the impact of the hierarchy of the adroitness of articulators on the frequency of occurrence of the "liquids" (the semivowels--w, y, and all other phonological units--l, r, etc.--at aperture 3) in the monosyllabic words in Deccani Urdu. The actual frequencies of the opposing phonlogical units in terms of articulators, are presented in Table I-5.

LIQUIDS Aperture 3	CVC words		CVCC words		CCVC words		Total	
Articulators	No	%	No.	%	No.	%	No.	%
Apex-Teeth	393	78,92	73	100	2	18.18	468	80.41
Apex-Palate	87	17.74	0	0	0	0	87	14.95
Apex	480	96.39	73	100	2	18.18	555	95.36
Labium	4	.80	0	0	2	18.18	6	1.03
Dorsum	4	.80	0	0	2	18.18	6	1.03
Medium	10	2.01	0	0	5	45.46	15	2.58
Total	498	100	73	100	11	100	582	100

Table I-5: Frequency of the Liquids in the Monosyllabic Words in Terms of Articulators

Comments on Table I-5

Comment 1: As seen in the last column in this table, of the 582 occurrences of the "liquids" in the monosyllabic words, 555 are apical, 6 dorsal, 6 labial, and 15 medial. As these

figures show, the apical "liquids" (555) appear in a ratio of over 19 to 1 with the labial, dorsal and medial "liquids", combined (27). That is, there is a drastic skewing, approaching an almost total skewing, in favor of the occurrences produced by the most adroit apex. Of course, it is the extraordinary adroitness of the apex that brings about this drastic skewing in favor of the apical liquids.

Another manifestation of the extraordinary adroitness of the apex can be seen in the formation of two orders of consonantal units at aperture 3, the apico-dental liquids l r and the apico-palatal liquids L R R^h. Parenthetically, it may be noted that within these two apical liquids, as seen in the figures in Table I-5, the apico-dental (468) are vastly favored over the apico-palatal (87). (For details, cf. Chapter II, section B.)

As seen in the last column in the table for the liquids, there are only 6 occurrences each for the labial and the dorsal w produced by the more adroit labium and dorsum, but there are 15 occurrences for the medial y produced by the less adroit medium. This skewing in the frequency of occurrence against the labium-dorsum and in favor of the medium requires an explanation.

It may be pointed out that the semivowel w is produced simultaneously by two articulators, the labium and the dorsum. (That is why, the occurrences of w are listed twice in the table

under discussion.) The low frequency of w may be attributed to the human trait to sparingly utilize the more complex units in terms of the number of articulators. (Cf. Chapter II, section A.)

Now a word about the 15 occurrences of the medial semivowel y. Unlike the labio-dorsal w, the medial y is produced by only one articulator, namely, the medium. In terms of number of articulators, therefore, y may be preferred over w (For further details, also see comment 4 below.)

Comment 2: As seen in the CVC column in the table above, of a total of 498 occurrences of "liquids" in the CVC words, the apicals occupy the top position with 480 occcurrences. As noted above, this drastic skewing in favor of the apical liquids may well be attributed to the extraordinary adroitness of the apex as an articulator. Further, among the apical liquids, the highly favored apico-dentals (393) appear in a ratio of 4½ to 1 with the disfavored apico-palatals (87). (Cf. Chapter II, section B.)

As compared to the high frequency of the apical liquids, the labial, the dorsal, and the medial liquids are characterized by the low frequency of occurrences. As seen in the CVC column in the table, the labial and the dorsal (labio-dorsal w) have 4 occurrences each, whereas the medial (y) has 10 occurrences. This skewing in favor of the medial liquid is against our expectation in terms of the hierarchy of

adroitness of articulators. But as noted in comment 1 above, the rationale for this skewing may be provided by taking into account the human preference of using more frequently the phonolgoical units produced by fewer articulators over those produced by more articulators. (Cf. Chapter II, section A.)

Comment 3: As seen in the CVCC column of the table above, there are 73 occurences in all for the liquids in the CVCC words. It is noteworthy that all these 73 occurrences belong to the apical liquids (l, r, etc.); there is no occurrence of the labio-dorsal w or the medial y in these words with final consonant cluster. That is, we encounter a total skewing in favor of the apical liquids and against the labial, dorsal and medial liquids in these words. As noted earlier, this total skewing infavor of the apical liquids is fully justified in view of the extraordinary adroitness of the apex.

Parenthetically, it may be noted that of the 73 occurrences of the apical liquids in the CVCC words, all appear as apico-dental, with a 0 frequency for the apico-palatal. This total skewing in favor of the apico-dental liquids is explained in Chapter II, section B.

Comment 4: As shown in the CCVC column in Table I-5, there are only 11 occurrences of the liquids for all the 7 CCVC words in Deccani Urdu. Of these 11 occurrences of the liquids, the apical, the labial and the dorsal have 2 occurrences each, whereas the medial liquid y alone has 5

occurrences. This unexpected skewing in favor of medial liquid may be explained in terms of the syntagmatic make-up of the CCVC words. In Urdu, the second member of the initial consonant cluster is restricted to only the semivowels y and w. And it so happens that 5 of the 7 CCVC words in Deccani Urdu contain semivowel y as the second member of the initial cluster.

Section C: The Medium-Dorsum Mass as the Articulator for Vowels

Unlike the apex of the tongue, the musculature of the medium-dorsum is ideally suited for the production of the clearly audible, vocalic units of a language. For, with its massy structure and wide rectangular shape, in combination with the labia, the medium-dorsum is perfectly suitable to form supraglottal resonant cavities, which are a necessary requirement for the production of the clearly audible sounds (the "vowels").

The supraglottal cavity extends from the glottis to the lips, and the principal technique for producing clearly audible, vocalic sounds is to use the medium-dorsum, and the lips, as articulators to determine the shape and size of the cavity. The medium-dorsum divides the oral cavity into two cavities, the back and the front, each with its own resonant frequency. Both the size and the opening of the back cavity is determined by the relevant articulator (the medium, the front dorsum, or the

back dorsum) of the medium-dorsum mass. But only the size of the front cavity is determined by the relevant medium-dorsum articualtor, whereas the opening of this cavity is determined by the labia as an articulator. And of course, the resonant frequency of each cavity is determined by its own size and opening, with the excitation coming from the V(oice) through the vibration of the vocal folds.

In Diagram I-3, we present the vocalic system of Deccani Urdu in terms of the three articulators of the medium-dorsum mass. It may be pointed out that the vocalic system, as presented in this diagram, is an excerpt of the phonolgoical grid presented earlier in Diagram I-1.

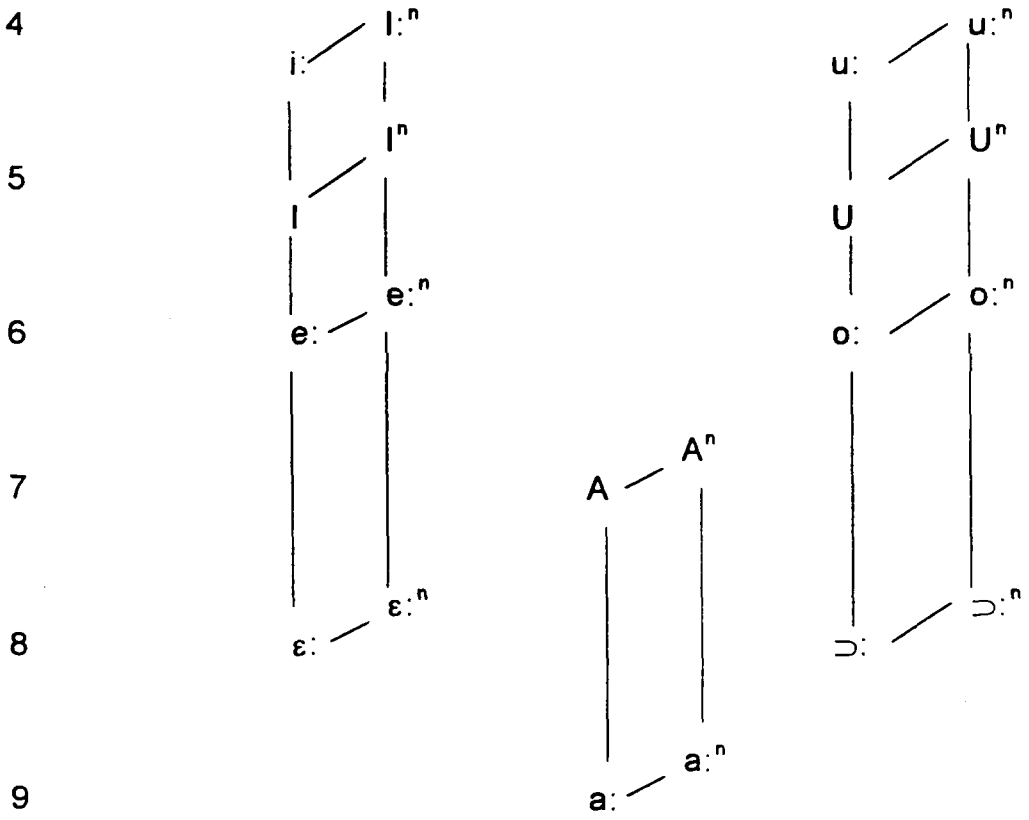

Diagram I-3: The Vocalic System of Deccani Urdu

As seen in the above diagram of the vocalic system of Deccani Urdu, the musculature of the medium-dorsum mass is divided into three distinct articulators, namely, the medium, the front dorsum, and the back dorsum, traditionally known as the "front", the "central", and the "back", respectively. These three articulators combine independently with different degrees of clearly audible aperture--ranging from 4 to 9--to produce 20 vocalic units in this dialect of Urdu. Of these 20

vocalic units, the medium and the back dorsum produce 8 units each (4 oral, 4 nasal), whereas the front dorsum forms only 4 units (2 oral, 2 nasal).

As noted above, there is a parity in the number of units produced by the medium and the back dorsum as articulators. For all the 8 medial ("front") vowels--i: I e: ɛ: and $i:^{n}$ I^{n} $e:^{n}$ $ɛ:^{n}$ -- have 8 matching back dorsal ("back") vowels--u: U o: ɔ: and $u:^{n}$ $U:^{n}$ $o:^{n}$ $ɔ:^{n}$. The crowding of 4 vocalic units, whether oral or nasal, at the axis of the back dorsum is against our expectation in terms of Andre Martinet's concept of the asymmetry of the vocal tract. For, inasmuch as the back dorsum is closer to the vertex of the angle of the jaw than the medium, there is less vertical space available to the back dorsum in comparison with the medium.

However, the impact of the angle of the jaw can be more than compensated by the use of the labia as an additional articulator for producing the labio-dorsal ("back rounded") vowels in some languages and dialects. That is why it becomes acoustically natural for the "back rounded" vowels to have parity with the "front unrounded" vowels, as seen in Deccani Urdu. (For further details, cf. Chapter V, section C.)

Further, it is not coincidental that whereas both medium and back dorsum utilize apertures 4,5,6 and 8, the front dorsum interacts at its own, distinctly different, apertures, namely, 7 and 9. Inasmuch as no front dorsal ("central")

vocalic units are formed at apertures 4,5,6 and 8, there is only a two-way opposition between the medial ("front") vowels and the back dorsal ("back") vowels. With the maximum horzontal space available for the opposing "front" and "back" units, the acoustic distinction between the opposing units can easily be maintained by the speaker and can clearly be perceived by the hearer. That is why, a horizontal opposition between 8 "front" vowels (4 oral, 4 nasal) and 8 "back" vowels (4 oral, 4 nasal) is fully maintained in Deccani Urdu. However, the four-way opposition by the medium "front" and by the back dorsum "back", does create vertical crowding of the vocalic units, and it requires precision of control on the part of the speaker to maintain the acoustic distinction between the opposing units. It is therefore reasonable to assume that there may be a relatively less frequent utilization of the "front" and the "back" vowels in the syntagmatic organization of the word in Deccani Urdu.

Unlike the medial ("front") and the back dorsal ("back") vowels, the front dorsal ("central") vowels--A A^{n} and a: $a:^{n}$--have no horizontal opposition at all, as they stand alone on their apertures, 7 and 9, respectively. To be sure, there is a two-way vertical opposition (apertures 7 *versus* 9) for the "central" vowels. However, there is sufficient space in between the opposing "central" vowels that should provide the necessary margin for the easy production and the clear

perception of these vowels. We therefore expect that the "central" vocalic units, though fewer in number, will be more frequently used in the formation of words than the medial ("front") and the back dorsal ("back") vocalic units, notwithstanding the predominance of the latter in terms of the number of units.

With a view to ascertaining the validity of our predictions, we need to examine the frequency of occurrence of the vocalic units in the syntagmatic organization of the word in Deccani Urdu, in association with the medial ("front"), the back dorsal ("back") and the front dorsal ("central") as articulators. This is taken up in Table I-6 and Table I-7 below.

Vocalic Units	ORAL			NASAL			TOTAL		
	No. of Units	Frequency No.	%	No. of Units	Frequency No.	%	No. of Units	Frequency No.	%
Medial "Front"	4	339	25.74	4	81	19.38	8	420	24.21
Back Dorsal "Back"	4	375	28.46	4	106	25.36	8	481	27.73
Front Dorsal "Central"	2	603	45.80	2	231	55.26	4	834	48.06
Total	10	1317	100	10	418	100	20	1735	100

Table I-6: Frequency of Oral and Nasal Vocalic Units in the Monosyllabic Words in Terms of Articulators

Comments on Table I-6

Comment 1: As seen in the column for the total number of units in the table above, there are 20 vocalic units, 8 "front", 8 "back", and only 4 "central" in Deccani Urdu. That is, whereas

there is a parity in the number of units for the "front" and the "back" vowels, the number of "central" vowels is just half in relation to the "front" and the "back" vowels, separately. The rationale for this particular distribution of the vocalic units in the paradigm, has already been presented in the introductory remarks above.

As seen in the last column of the table, of the total of 1735 occurrences of all the vocalic units, in the monosyllabic words, 420 occurrences are medial ("front"), 481 back dorsal ("back"), and 834 front dorsal ("cental"). That is, the "central" vowels appear in a ratio of about 2 to 1 in comparison with the "front" vowels and the "back" vowels, separately.

As we have discussed above, the "central" vocalic units (A A^{n} and a: $a:^{n}$), thought fewer in number, appear alone on their apertures (7 and 9 relatively), and are less complex in their physiologico-acoustic make-up. As expected, therefore, there is s vast skewing in favor of these vowels and against the numerically strong "front" vowels (i: I e: ɛ: and $i:^{n}$ I^{n} $e:^{n}$ $ɛ:^{n}$) and "back" vowels (u: U o: ɔ: and $u:^{n}$ U^{n} $o:^{n}$ $ɔ:^{n}$). For the "front" vowels and the "back" vowels of Deccani Urdu require precision of control in their production by the speaker and an extra effort in their perception by the hearer, and these vowels are therefore disfavored in terms of human behavior. (Cf. Chapter II.)

Finally, it may be noted that there is a fair competition in the frequency of usage between the "front" vowels (420 occurrences) and the "back" vowels (481 occurrences) in Deccani Urdu. As we have discussed in the introductory remarks above, this competitive usage of the two vocalic types is all right, for the symmetry of the vocal tract affecting the "back" vowels is more than compensated by the interaction of the labium in the production and perception of these labio-dorsal vowels.

Comment 2: As seen in the column for the oral vowels in Table I-6, there are 10 vocalic units, 4 "front", 4 "back", and 2 "central". (For this distribution of the vocalic units, cf. comment 1.)

As shown in this column, of the 1317 words using oral vocalic units, 339 words employ the "front" vowels, 375 the "back" vowels, and 603 the "central" vowels. In comparison with the over all distribution of the three types of vowels presented in comment 1 above, there is a slight decrease in the usage for the "central" vowels and a comparative increase in the usage for the "front" and the "back" vowels among the oral vowels in Deccani Urdu. This slightly competitive use of the three vocalic types in the monosyllabic words, is directly related to the simple, less complex character of the oral vowels. The slight skewing in favor of the "front" and the "back" vowels and against the "central" vowels, as observed

here, is fully justified in view of the human preference for simpler phonological units over more complex units.

Comment 3: As seen in the column for nasal vowels in Table I-6, there are 10 vocalic units, 4 "front", 4 "back" and only 2 "central". (For this distribution of the vocalic units, cf. comment 1 above.)

Again, as seen in the same column, there are 418 nasal occurrences in the monosyllabic words. Of these 418 occurrences, there are 81 "front" vowels, 106 "back" and 231 "central". In comparison with the over all distribution of the three types of vowels presented in comment 1 above, there is a slight increase in the usage for the "central" vowels and a comparative decrease in the usage for the "front" and "back" vowels among the nasal vowels in Deccani Urdu. Inasmuch as the nasal vowels are produced by an additional articulator, the velum, they are more complex than their oral counterparts. In view of the nasal complexity, the favored "central" vowels become additionally favored and the disfavored "front" and "back" vowels become additionally disfavored in the syntagmatic make-up of the word in Deccani Urdu.

Vocalic Units	Long Vowels			Short Vowels			TOTAL		
	No. of Units	Frequency No.	%	No. of Units	Frequency No.	%	No. of Units	Frequency No.	%
Medial "Front"	6	330	29.44	2	90	14.66	8	420	24.21
Back Dorsal "Back"	6	362	32.29	2	119	19.38	8	481	27.72
Front Dorsal "Central"	2	429	38.27	2	405	65.96	4	834	48.07
Total	14	1121	100	6	614	100	20	1735	100

Table I-7: Frequency of Long and Short Vocalic Units in the Monosyllabic Words in Terms of Articulators

Comments on table I-7

Comment 1:

As seen in the last column of the table above, there are 20 vocalic units in Deccani Urdu, 8 "front", 8 "back", and 4 "central". (for this distribution of the vocalic units, cf. Table I-6, comment 1.)

As shown in the last column of the table, of the 1735 vocalic occurrences in all the monosyllabic words, there are 420 medial ("front"), 481 back dorsal ("back"), and 834 front dorsal ("central"). (For the rationale of this syntagmatic distribution of the vocalic units, cf. Table I-6, comment 1.)

Comment 2: As seen in the column for long vocalic units in this table, of the 14 long vowels, 6 are medial ("front"), 6 back dorsal ("back"), and 2 front dorsal ("central"). That is, the

"central" vocalic units appear in a ratio of 1 to 3 the 'front" and the "back" vocalic units, separately. It is noteworthy that the larger number of long vocalic units in the "front" and the "back", is sustained by the very duration of these vowels. For the length becomes an aid in a smooth production and an easy perception of the long vowels in Deccani Urdu.

As seen in the column for the long vowels, of the 1121 occurrences of these vowels in the monosyllabic words, 330 are "front", 362 are "back" and 429 are "central". In comparison with the over all distribution of the three types of vowels presented in comment 1 above, there is a substantial decrease in the usage for the "central" vowels *vis-a-vis* the "front" and the "back" vowels, among the long vowels. That is, the syntagmatic usage of the "front", "back" and "central" vowels becomes more competitive among the long vowels. This particular syntagmatic distribution is brought about by (1) the increase in the number of units for the "front" and the "back" vowels, and (2) the length of these vowels that facilitates their smooth production by the speaker and the easy perception by the hearer.

Comment 3: As seen in the column for short vowels in Table I-7, there are 6 vocalic units, 2 medial ("front"), 2 back dorsal ("back"), and 2 front dorsal ("central"). That is, there is a parity in the number of units for all three types of vocalic units.

As we have noted in comment 2 above, the duration of the long vowels has facilitated the formation of threefold more units in the "back" and the "front" than in the "central", in Deccani Urdu. But no such facility in the production and perception is available in the case of short vowels. If there were more than one short vocalic units in the "back" and the "front", it would require an extra effort in their discrimination by the native speakers. It is therefore perfectly understandable that a complete parity in the number of units is realised in the form of the ideal phonolgical triangles, I A U and I^n A^n U^n, in Deccani Urdu.

Now a word about the syntagmatic distribution of the short vowels in Deccani Urdu. As seen in Table I-7, of the 614 occurrences of short vowels in the monosyllabic words, there are 90 "front", 119 "back" and 405 "central". Thus, the short "central" vowels appear in a ratio of 4½ to 1 in comparison with the "front" vowels, and almost 3½ to 1 in comparison with the back vowels. As we have noted earlier in the introductory remarks, of all the vowels, the "central" vowels, A (schwa) and a:, are the simplest in terms of physiology and acoustics, and are therefore vastly favored over the "front" and the "back" vowels. Given the parity in the number of units for the "front", "central", and "back" among the short vowels in Deccani Urdu, it is perfectly in conformity with our expectations that the frequency of occurrence for the short vowels be vastly tilted in

favor of the "central" vowels and against the "front" and the "back" vowels.

Section D: Summary and Conclusions

In this chapter, we have made an attempt to briefly present the physiological base of Deccani Urdu phonology in terms of physiological mechanism, an orienting (phonological) principle of Columbia school of linguistics. Here we have taken up only those physiological characteristics of the vocal tract that provide justification for the phonolgical skewings observed in the paradigmatic make-up and the syntagmatic organization of the word in Deccani Urdu.

In section A, we have presented the phonological grid of Deccani Urdu (Diagram I-1), followed by explanatory comments dealing with the different aspects of the grid. It is noted that the phonological units in the grid are primarily established by contrast through minimal and subminimal pairs in terms of communication, another orienting principle of Columbia school of linguistics. However, these phonological units have been appropriately placed on the intersections of the relevant axes of articulators and apertures on the basis of their substantive charactristics in terms of the physiology of the vocal tract.

We have established 9 degrees of aperture, and 8 articulators for the placement of phonological units in the phonological grid of Deccani Urdu. The degrees of aperture

are subjected to two broad divisions, namely, the constriction *versus* opening, and the clearly audible *versus* less clearly audible.

The constriction apertures, extending from ∅ through 2 are used to produce the "stops", and the "fricatives", whereas the opening apertures, extending from 3 through 9, are utilized in the production of "liquids", and the "vowels" in Deccani Urdu.

The division of apertures into the clearly audible and the less clearly audible is primarily carried out in terms of acoustic medium, another orienting principle that motivates the phonological analysis in the present research. In Deccani Urdu, the clearly audible apertures (4 through 9) are used in the production of the vocalic units, whereas the less clearly audible apertures (∅ through 3) are used in the production of the consonantal units.

Articulators are the adroit vocal organs that are placed horizontally along the vocal tract. In view of their characteristic functioning, they have been divided into the glottal articulators (the vocal folds), and the supraglottal articulators. The supraglottal articulators combine with the degrees of aperture to shape, and in some instances to excite, the vocal cavity in the production of speech sounds. Besides producing some other sounds at its own apertures, the glottal articulators, in combination with glottal aperture 1, articulates

V(oice) that excites the vocal cavity in the production of the voiced speech sounds.

The articulators that are particularly relevant to the production of phonological units in Deccani Urdu, are the labia, the apex, the medium, the front dorsum, the back dorsum, the velum and the glottis.

On the intersections of the relevant articulators and apertures, we have established 60 phonolgoical units for Deccani Urdu. Of these 60 phonological units, 56 are fulfledged "phonemes", the elemental units of communication. The other 4 units are non-distinctive positional variants that appropriately fill some empty intersections on the phonological grid, and have therefore been raised to the status of phonological units. Further, three highly abstract units of V(oicing), A(spiration), and N(asality), have also been placed on the phonological grid. For these three units are superimposed on other, simpler phonological units to produce more complex units, i.e., the voiced stops, the voiceless aspirated stops, and the nasal vowels, respectively, in Deccani Urdu.

In section B, we have evaluated the impact of the hierarchy of adroitness of articulators on the paradigmatic make-up of consonantal units and their frequency of occurrence in the monosyllabic words of Deccani Urdu. As a yardstick, we have set up the scale of adroitness of

articulators, with the apex as the most adroit, the dorsum (and the labium) as more adroit, the medium as less adroit, and the post dorsum as the least adroit. In accordance with this scale relationship, we predicted that the apical consonants should be most peferred both in the number of units and in their frequency of usage in the word in Deccani Urdu, as in any other language or dialect. On the same basis, we predicted that the dorsal or labial consonants, the medial consonants, and the post dorsal consonants should be progressively disfavored in terms of the number of units and their frequency of usage in the word. And we have amply demonstrated through actual counts that the paradigmatic and the syntagmatic distribution of phonological units fully conforms to our expectations.

Of all four types of consonants, the apical ("dental" and "retroflex") consonants are found to be vastly favored both in the number of units and their frequency of occurrence in the word. It has also been noted that the post dorsal axis, though still maintained in modern standard Urdu with only one phonological unit (q), is totally eliminated from Deccani Urdu.

Further, as we have shown, the dorsal ("velar") consonants and the labial consonants compete well with each other in the make-up of the consonantal paradigm and in their syntagmatic usage in the word. Finally, it has been demonstrated that in comparison with the dorsal and the labial

consonants, the medial ("palatal") consonants fall a notch below in terms of the number of units, and they are far behind in their frequency of usage in the monosyllabic words in Deccani Urdu.

In section C, we have dealt with the medium-dorsum mass as the articulator for vowels. It is argued that the massy structure and the rectangular shape of the medium-dorsum mass is ideally suited for the formation of two resonant cavities, which are a necessary requirement for the production of vowels in a language. The musculature of the medium-dorsum mass is divided into three distinct articutors, namely, the medium, the front dorsum, and the back dorsum, traditionally known as "front", "central", and "back", respectively. It has been shown through a diagram that these three articulators, in association with the clearly audible apertures 4 through 9, produce 20 vocalic units in Deccani Urdu.

Of the 20 voclaic units in Deccani Urdu, 8 are produced by medium ("front"), 8 by back dorsum ("back"), and 4 by front dorsum ("central"). It has been noted that despite the asymmetry of the vocal tract, we encounter a parity in the number of units produced by the medium and the back dorsum as articulators. For all the 8 medial ("front") vowels--i: I e: ɛ: and $i:^{n}$ I^{n} $e:^{n}$ $ɛ:^{n}$ --have 8 corresponding back dorsal ("back") vowels--u: U o: ɔ: and $u:^{n}$ U^{n} $o:^{n}$ $ɔ:^{n}$. In defense of this parity,

it has been argued that as all the back dorsal vowels are labio-dorsal ("back rounded"), the impact of the angle of the jaw with its vertex at the back, is more than compensated by the use of the labia as an additional articulator in the production of these vowels in Deccani Urdu.

Further, it has been noted that there is only a two-way horizontal opposition between the medial ("front") vowels and the back dorsal ("back") vowels in Deccani Urdu. For no front dorsal ("central") vowel is formed in between them on their own apertures. As the opposing "front" and "back" vowels are formed at the fringes of the horizontal axes, there is maximum horizontal space available to the opposing units for a relatively easy production and a clear perception of these vowels. It is argued that this factor also contributes to the parity of the "front" and the "back" vowels in Deccani Urdu.

However, it has also been noted that the four-way opposition at the axis of both the medium ("front") and the back dorsum ("back") does create vertical crowding of the vocalic units, and it requires precision of control on the part of the speaker to maintain the acoustic distinction between the opposing units. In conformity with the human trait to disfavor relatively more complex phonological units, it has been established through frequency counts that in comparison with the "central" vowels, the "front" and the "back" vowels are less

frequently utilized in the syntagmatic organization of the word in Deccani Urdu.

Unlike the medial ("front") and the back dorsal ("back") vowels, the front dorsal ("central") vowels--A A^{n} and a: $a:^{n}$--have no horizontal opposition at all, as they stand alone on their apertures, 7 and 9, respectively. To be sure, there is a two-way vertical opposition--A *versus* a: and A^{n} *versus* $a:^{n}$ --at apertures 7 *versus* 9 for the "central" vowels. However, there is sufficient space in between the opposing "central" vowels for an easy production and a clear perception of these vowels. That is why the "central" vocalic units, though fewer in number *vis-a-vis* the "front" and the "back" vocalic units, are more frequently utilized in the formation of words in Deccani Urdu.

Finally, it has been noted that there is an asymmetry in the number of units for the long vowels (14) in comparison with the short vowels (6) in the vocalic paradigm of Deccani Urdu. It has been argued that this discrepancy in the number of vocalic units is brought about by the quantitiative distinction of the duration itself. The greater duration of the long vowels greatly facilitates their proper production and clear perception by the native speakers. On the contrary, the momentary phase of the short vowels in the speech chain, becomes a hindrance in the exact articulation and clear perception of these vowels. In consequence, Deccani Urdu has a rich, 7-vowel system for the long vowels, for both the

oral vowels and the nasal vowels. At the same time, the problems of articulation and perception associated with the short vowels, are satisfactorily resolved in Deccani Urdu by forming a 3-vowel system for these vowels in the form of an ideal phonological triangle in I A U and I^n A^n U^n in Deccani Urdu.

To conclude:

(1) The phonolgoical grid of Deccani Urdu is a systematic presentation of all its phonological units. The grid is primarily based on the physiological criteria of articulators and apertures. The "substance" of the phonological units is determined by the articulatory characteristics of these units.

(2) The network of phonological units presented in the phonological grid also highlights the interrelationships of these units. That is, the grid also indicates the "value" relationship of the phonological units. Thus equal weight is given to both, the phonetic substance and the phonological value in the present analysis.

(3) A total of 60 phonological units have been established for Deccani Urdu. Of the 60 phonological units, 56 are fulfledged "phonemes", the elemental units of communication. The other 4 units are non-distinctive positional variants that appropriately fill some empty intersections of articulators and apertures in the phonological grid, and have therefore been elevated to the status of phonological units.

(4) Of the 60 phonological units established for Deccani Urdu, 40 are consonantal and 20 vocalic. The scale of the adrotiness of articulators is an important yardstick for evaluating the particular distribution of consonantal units and their frequency of usage in the word in Deccani Urdu, as in any other language or dialect. In terms of this scale, it is demonstrated through statistical support that the apical consonants are most favored, the dorsal/labial more favored, the medial less favored, and the post dorsal least favored.

(5) The musculature of the medium-dorsum mass is divided into three distinct articulators, namely, the medium ("front"), the front dorsum ("cental"), and the back dorsum ("back"). Of the 20 vocalic units in Deccani Urdu, 8 are produced by the "front", 8 by the "back" and only 4 by the "central". The "central" vocalic units, though fewer in number, are more frequently utilized in the formation of words than the "front" and the "back" units, separately. As demonstrated through statistical support, this vocalic skewing is brought about by the vertical overcrowding of the "front" and the "back" vowels *vis-a-vis* the lesser physiologoico-acoustic complexity of the "central" vowels.

(6) Of the 20 vocalic units of Deccani Urdu, 14 are long and only 6 are short. It is argued that this asymmetry in the number of units for the long and the short vowels, is brought about by the polar distinction in duration of the opposing

vowels. The prolonged duration of the long vowels becomes an aid to an easier articulation and a clearer perception of these vowels. However, as this aid through sustained duration is not available to the short vowels, the problems of articulation and perception of these vowels are resolved in Deccani Urdu by the formation of a 3-vowels system for both short oral and short nasal vowels.

(7)In validation of our phonological analysis in terms of physiological mechanism in this chapter, it is found that more often than not there are other articulating principles which are at work in creating the phonological skewings that are encountered in Deccani Urdu. Thus, in many cases the distribution of phonological units in Deccani Urdu reflects an interaction of physiology and acoustics or physiology and human behavior. In the chapter that follows, we particularly evaluate the role the human behavior plays in the phonology of Deccani Urdu.

CHAPTER II
HUMAN BEHAVIOR ORIENTATION OF DECCANI URDU PHONOLOGY

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In this chapter, an attempt is made to explain the paradigmatic make-up and the syntagmatic distribution of phonological units in Deccani Urdu, in terms of human behavior, an orienting principle for the theoretical framework of Columbia school of linguistics.

The human beings, in their daily endeavors of life, including language, resort to their underlying behavioral characteristics: the human intelligence and laziness. As a repercussion of these inherent human traits (intelligence and laziness), human beings seek a minimax solution between minimum effort and maximum accomplishment.

As stated earlier in the introduction, human beings utilize their intelligence or problem solving ability to infer the meaning of even complex expressions, with the help of situation and context. The human laziness refers to the economy of effort, that is, a general avoidance of the use of a greater degree of precision than is necessary for the accomplishment of any given task.

Thus, the power of inference and the economy of effort are the products of human intelligence and laziness. And it is both inference and economy that interact to exert tremendous pressure on language.

In phonology, as we have noted earlier, we particularly look for skewings (readily observable favorings and disfavorings) in the paradigmatic make-up of the phonological units and their frequency of occurrence in the word. For we predict that all these skewings can be satisfactorily explained in terms of our five orienting principles--the communicative intent, the physiology of the vocal tract, the acoustic medium, the vision, and the human factor. Some of the phonological skewings, both syntagmatic and paradigmatic, as encountered in Deccani Urdu, are, in our judgement, clearly motivated by the human trait of intelligence (the power of inference) and laziness (the economy of effort). It is these skewings that are dealt with in this chapter.

The phonological analysis of Deccani Urdu in terms of human behavior is presented in six sections. Section A deals with the preference of fewer articulators over more articulators in the production and distribution of phonological units. In section B, we analyze the relation between the apico-dental ("dental") consonants with the proximate point of articulation and the apico-palatal ("retroflex") consonants with the remote point of articulation. In section C, we evaluate the impact of

assimilative trait of neighboring phonological units on the combinatory phonology of Deccani Urdu. In section D, we examine the effect of the degree of aperture change in terms of precision of control, on the favoring and disfavoring of phonological units. In section E, we discuss the human behavior justification for the phonological grid of Deccani Urdu. In section F, we present summary and conclusions with regard to the impact of human behavior on the phonology of Deccani Urdu.

Section A: Preference for Fewer Articulators over More Articulators

In view of the well-known trait of human beings to minimize and economize in all situations, it is to be anticipated that phonological units produced by fewer articulators will be preferred over units produced by more articulators. For the simultaneous use of greater number of articulators requires fine and precise coordination of the articulators that is disfavored in view of the human trait pertaining to the economy of effort.

It may be noted that the preference for fewer articulators over more articulators affects the distribution of phonological units on both the syntagmatic and the paradigmatic levels. The phonological skewings as encountered in the paradigmatic make-up and the syntagmatic distribution of the

phonological units are here explained in terms of fewer *versus* more articulators.

The three main dichotomies among the phonlogical units of Deccani Urdu brought about by the use of an extra articulator, are Voiced *versus* Voiceless consonants, Aspirated *versus* Unaspirated among the voiceless stops, and Nasal *versus* Oral vowels. These three types of opposing units will be dealt with in subsections A1, A2, and A3, respectively.

Section A1: Glottis as an Additional Articulator: Voiced *versus* Voiceless Consonants

The unaspirated stops and the fricatives of Deccani Urdu are characterized by a distinction of voicing and voicelessness. Whereas voiceless consonants are produced by only the supraglottal articulators, their voiced counterparts make use of an additional articulator, namely, the glottis, in their production. The simultaneous use of the glottal articulator makes the voiced consonants less favored than their voiceless counterparts in terms of the number of articulators. We therefore expect a skewing, commensurate with this criterion, in the make-up and distribution of the voiceless and the voiced consonants in Deccani Urdu.

In the following subsections, we evaluate the impact of the glottis, as an additional articulator for V(oicing), in the paradigmatic make-up and the syntagmatic distribution of the unaspirated stops and the fricatives in Deccani Urdu.

Section A1(a): Voiced *versus* Voiceless among the Unaspirated Stops

As seen in the phonological grid (Diagram I-1), there are 20 phonological units ("stops") in Deccani Urdu. Traditionally, the stops are divided into four types in terms of voicing and aspiration--the voiceless unaspirated, voiced unaspirated, voiceless aspirated, voiced aspirated --, as presented in Table II-1 below.

Stop Types	Points of Articulation Labial	Dental	Retroflex	Palatal	Velar	Number of units
Voiceless Unaspirated	p	t	T	c	k	5
Voiced Aspirated	b	d	D	j	g	5
Voiceless Aspirated	p^h	t^h	T^h	c^h	k^h	5
Voiced Aspirated	b^h	d^h	D^h	j^h	g^h	5
Total	4	4	4	4	4	20

Table II-1: Traditional Stop Types of Deccani Urdu in Terms of Voicing and Aspiration

In traditional analysis, it is assumed that the aspirated b^h d^h g^h etc., are the voiced counterparts of p^h t^h k^h etc. However, as discussed in our four-way classification of stops (cf. Chapter V, section D), the relationship of the voiced aspirates to other stop types in this classification, is much

more complex. Therefore, our analysis of the voiceless *versus* voiced stops is here limited to only the unaspirated stops.

As seen in Table II-1, of the 10 unaspirated stops in Deccani Urdu, 5 stops (p t T c k) are voiceless and 5 (b d D j g) are voiced. That is, there is a parity in the number of units for the voiceless and the voiced stops. This parity is okay, for it neither proves nor disproves that the simple p t k etc., are favored over the complex b d g etc.

It is noteworthy that the post dorsal voiceless unaspirated stop q, produced by the post dorsum as an articulator, did exist in old Urdu and has been preserved in classical Urdu, as well as in modern standard Urdu. However, this "uvular" stop was lost in Deccani Urdu, and was merged with the dorsal x. This elimination of the voiceless post dorsal stop q has wiped out the obvious skewing in favor of the voiceless stops, and has brought about a parity in the number of units between the voiceless and the voiced stops in Deccani Urdu.

Nevertheless, the preference for the voiceless stops, *vis-a-vis* the voiced stops, clearly shows up in their frequency of usage in the word in Deccani Urdu, as seen in Table II-2 below.

Stops (Unaspriated)	CVC No	%	CVCC No	%	CCVC No	%	Total No	%
Voiceless (p t k etc.)	775	59.71	89	44.72	4	66.67	868	57.75
Voiced (b d g etc.)	523	40.29	110	55.28	2	33.33	635	42.25
Total	1298	100	199	100	6	100	1503	100

Table II-2: Frequency of the Voiceless and the Voiced among the Unaspirated Stops in the Monosyllabic Words.

Comments on Table II-2

Comment 1: As seen in the last column in this table, of the 1503 occurrences of unaspirated stops in all the monosyllabic words, 868 (57.75%) occurrences are voiceless and 635 (42.25%) are voiced. Thus, there is a sharp skewing in favor of the voiceless stops and against the voiced stops. This clear skewing can best be explained in terms of human preference for phonological units with fewer articulators.

Comment 2: In the CVC words, as seen in Table II-2, of the 1298 occurrences of the unaspirated stops, there are 775 instances of the voiceless stops and 523 instances of the voiced stops. Thus, the voiceless stops (produced by only the supraglottal articulators) are favored almost 3 to 2 in comparison with the voiced stops (produced with an extra, glottal articulator).

This vast skewing in favor of the voiceless stops and against the voiced stops is fully justified in view of the over all human preference for simpler phonological units over more complex units in any language.

Comment 3: In the CCVC column, as seen in the table, there are only 6 occurrences of the unaspirated stops in the monosyllabic words with initial consonant cluster. Of these 6 occurrences, the 4 instances of the voiceless stops appear in a ratio of 2 to 1 the 2 instances of the voiced stops. This tilt in favor of the voiceless stops and against the voiced stops, fully conforms to our expectations in terms of the human trait of preferring phonological units with fewer articulators over those with more articulators. It may however be noted that the insignificant number of occurrences (6) for both the voiceless and the voiced stops cannot have any statistical validity.

Comment 4: As seen in the column for the CVCC words in Table II-2, of the 199 occurrences of unaspirated stops, there are 89 occurrences of the voiceless stops *vis-a-vis* 110 occurrences of the voiced stops. The clear skewing in favor of the voiced stops and against the voiceless stops in the CVCC words, is against our expectation from the viewpoint of the human preference for phonological units with fewer articulators over those with an additional articulator. The rationale for this unexpected skewing may be provided by analyzing these occurrences in their syntagmatic context.

Thus, of the 199 occurrences of the unaspirated stops in the CVC_1C_2 words, 73 appear in word initial position. Of the remaining 126 occurrences, 13 appear in C_1 position, and 113 show up in C_2 position of the final consonant cluster.

Among the 73 occurrences in the initial position of the CVCC words, there are 37 instances of voiceless stops and 36 instances of voiced stops. Though there is a slight edge in favor of the voiceless stops, it is clear that there is a competitive use of the voiceless and the voiced stops in word initial position. However, it is noteworthy that this near parity in the frequency of usage between the opposing units is brought about by the communicative factor. For we expect fair competition between the opposing phonological units in the communicatively important initial position of the word. (Cf. Chapter III, section B.)

Of the 126 occurrences of the unaspirated stops appearing in the final consonant cluster, 13 appear in the C_1 position, and the remaining 113 in the C_2 position. Of the 13 C_1 occurrences, 9 are voiceless and 4 voiced. This vast skewing in favor of the voiceless stops and against the voiced stops is best explained in terms of human preference for fewer articulators over more articulators.

Of the 113 C_2 occurrences of the unaspirated stops in the final consonant cluster, 43 are voiceless, whereas 70 are vocied. This skewing in favor of the voiced stops and against

the voiceless stops is clearly contrary to our expectation in terms of the human trait of favoring fewer articulators over more articulators. The rationale for this unexpected skewing may well be found in the assimilative trait of neighboring phonological units. We present the syntagmatic distribution of these 113 occurrences in Table II-3.

C_2 Stops	Voiceless		Voiced		Total	
	No.	%	No.	%	No.	%
After C^N	9	14.75	52	85.25	61	100
After C^{vd}	7	28.00	18	72.00	25	100
After C^{vl}	27	100.00	0	0	27	100
Total	43	38.05	70	61.95	113	100

Table II-3: Frequency of the Voiceless and the Voiced Unaspirated Stops in the C_2 Position of the CVC_1C_2 Words.

As shown in Table II-3 above, of the 113 C_2 occurrences for the unaspirated stops, 61 appear after nasal consonants, 25 after other voiced consonants, and 27 after voiceless consonants.

As seen in the table, the 27 occurrences appearing after the voiceless consonants are all voiceless. This total skewing in favor of the voiceless and against the voiced stops is brought about by the interaction between two human behavior traits. namely, the preference for fewer articulators over more articulators and the assimilative trait of neighboring

phonological units. (Cf. section C.) For the two human traits reinforce each other in producing the total skewing in favor of the voiceless stops here.

As seen in the table, of the 25 occurrences of the unaspirated stops in the C_2 position after the (non-nasal) voiced consonants, only 7 are voiceless and 18 are voiced. This vast preference for the voiced stops is against our expectation in terms of the number of articulators. However, it is noteworthy that this sharp skewing in favor of the voiced stops is brought about by the assimilative trait of the preceding voiced consonants in this syntagmatic context (Cf. section C.)

As seen in Table II-3, of the remaining 61 occurrences of the C_2 stops that appear after the nasal consonants, only 9 occurrences are voiceless and 52 are voiced. That is, the voiced stops appear in a ratio of almost 6 to 1 in comparison with the voiceless stops. This vast skewing, approaching a tilt, in favor of the more complex voiced stops and against the simpler voiceless stops, is contrary to our expectations in view of the human preference for the simpler phonological units. Again, this extraordinary preference for the voiced stops is brought about by the powerful assimilative trait of the preceding voiced nasal consonants (particularly the dorsal nasal ŋ) in this syntagmatic context.

Section A1(b): Voiced *versus* Voiceless Fricatives

In this subsection, we evaluate the impact of the glottis as an additional articulator on the make-up and distribution of the voiced and the voiceless "fricatives" in Deccani Urdu. We first present the paradigmatic make-up of the fricatives, based on Diagram I-1, in Table II-4 below.

Fricatives	APERTURES					Number of units
	1 Labial	2 Apical	Medial	Dorsal	1½ glottal	
Voiceless	f	s	ʃ	x	□	4
Voiced	v	z	□	γ	h	4
Total	2	2	1	2	1	8

Table II-4: Paradigmatic Make-up of Deccani Urdu Fricatives

Comments on Table II-4

As seen in the table above, of a total of 8 fricative units, there are 4 voiceless and 4 voiced. Apparently, therefore, there is a parity in the number of units between the voiceless fricatives and the voiced fricatives.

However, it may be noted that the voiced h at aperture 1½ has a special status in the phonological paradigm of Deccani Urdu. This h is required to support the voiced aspirated series (b^h d^h g^h etc.) in Deccani Urdu, as in some other Indo-Aryan languages. (Cf. Diagram I-2, Comment c).

If we exclude the voiced h (produced at aperture 1½), we see that of the 7 fricative units, produced at apertures 1 and

2, 4 units are voiceless and 3 are voiced. This skewing in favor of the voiceless fricatives in the phonological paradigm is motivated by the human preference for simpler, less complex phonological units.

Finally, it may be noted that the empty slot for the voiced fricative in Deccani Urdu appears at the axis of the medium, the less adroit articulator in terms of the hierarchy of adroitness of articulators. (Cf. Chapter I, section B.) That is, the total skewing against the voiced medial fricative, is brought about by the interaction of two orienting principles – the physiologically based adroitness of articulators disfavoring the medial consonants, and the human trait of disfavoring the more complex voiced consonants.

Further, the impact of the larynx as an additional articulator for V(oicing) is more clearly manifest in the frequency of usage for the voiceless and the voiced fricatives in Deccani Urdu. The frequencies of the opposing units are presented in Table II-5.

Fricatives	CVC No.	%	CVCC No.	%	CCVC No.	%	TOTAL No.	%
Voiceless	309	75.55	107	71.81	2	66.67	418	74.50
Voiced (including voiced)h	100	24.45	42	28.19	1	33.33	143	25.50
Total	409	100	149	100	3	100	561	100
Voiced (excluding voiced)h	60		29		1		90	
Voiced h	40		13		0		53	
Total	100		42		1		143	

Table II-5: Frequency of Voiceless and Voiced Fricatives in the Monosyllabic Words

Comments on Table II-5:

Comment 1: As seen in the last column in the table, of the 561 occurrences of the fricatives in all the monosyllabic words, 418 are voiceless and 143 are voiced. That is, the voiceless fricatives appear in a ratio of almost 3 to 1 the voiced fricatives. This vast skewing in favor of the voiceless fricatives is in conformity with our expectation in terms of the human preference for phonological units produced by fewer articulators.

Comment 2: In the syntagmatically simple CVC words, as seen in the table, we encounter a vast skewing, appearing in a ratio of over 3 to 1 in favor of the voiceless fricatives (309) and against the voiced fricatives (100). Again, this skewing is

primarily motivated by the human triat of preferring fewer articulators over more articulators.

Comment 3: As seen in Table II-5, of the 149 fricative occurrences in the syntagmatically complex CVCC words, there are 107 occurrences of the voiceless and 42 occurrences of the voiced. Here we find that the ratio is reduced to 2½ to 1 in favor of the voiceless fricatives and against the voiced fricatives. This clear, though comparatively reduced preference for the voiceless fricatives, is primarily motivated by the human preference for the simpler, less complex phonological units.

Comment 4: As seen in the table above, of the 3 occurrences of the fricatives in the CCVC words, 2 are voiceless and 1 is voiced. Although the number is statistically insignificant to draw any definitive conclusions, the favoring for the voiceless fricatives over the voiced fricatives appears in a ratio of 2 to 1 even here. This skewing is also in conformity with our expectation in terms of the fewer *versus* more articulators.

Comment 5: Finally, a word about the frequency of the voiced h in Deccani Urdu. As shown in Table II-5, the figures for the voiced fricatives (143) also include the occurrences of the voiced h. As it happens, the voiced h has 53 occurrences in the monosyllabic words, 40 in the CVC words and 13 in the CVCC words. If we should accord a special status to the voiced h and exclude its occurrences from our consideration

of the voiceless *versus* voiced dichotomy for the fricatives, there will be a drastic skewing in favor of the voiceless fricatives and against the voiced fricatives. Thus, the revised figures would further highlight the validity of our claim that the human preference for simpler phonological units plays an important role in the phonology of a language.

Section A2: Glottis as an Additional Articulator: Aspirated *versus* Unaspirated among the Voiceless Stops

In Deccani Urdu, as in modern standard Urdu and some other Indo-Aryan languages, the stops are characterized by a distinction of aspiration and unaspiratedness. As the problem of aspiration in the voiced aspirated stops (b^h d^h g^h etc.) is very complex, it will be taken up afterwards, when we introduce the four-way classification of the stops, in Chapter V. Therefore, our analysis of the aspirated *versus* unaspirated stops in terms of the number of articulators, is here limited to only the voiceless stops.

Whereas the voiceless unaspirated stops (p t k etc.) are produced by the supraglottal articulators (the labium, the apex, the dorsum etc.) alone, the voiceless aspirated stops (p^h t^h k^h etc.) are produced by an additional articulator, namely, the glottis. The aspiration is formed by the puff of breath coming from the lungs through a particular maneuvering of the glottal articulator. The vocal folds in a triangular configuration

force the air to rush through this small opening (glottal aperture 2) that brings about aspiration. As indicated by A(spiration) in Diagram I-1, the aspiration so formed at the glottis is voiceless. As a matter of fact, this voiceless aspiration brought forth by the glottal articulator, is superimposed on the voiceless unaspirated stops to produce the voiceless aspirated slops. This superimposition of A(spiration) makes the voiceless aspirated stops physiologico-acoustically more complex than their unaspirated counterparts. We therefore expect that the voiceless unaspirated stops would be favored over the voiceless aspirated slops in terms of human preference for the simpler, less complex phonological units.

In view of our discussion above, we now evaluate the impact of the glottis as an additional articulator, on the make-up of units for the aspirated and the unaspirated stops and their frequency of usage in the word in Deccani Urdu.

First a word about the paradigmatic make-up of the opposing aspirated and unaspirated stops. As seen in Table II-1, there is a parity in the number of units for the voiceless unaspirated stops (5: p t T c k) and the voiceless aspirated stops (5: p^h t^h T^h c^h k^h) in Deccani Urdu. This parity in the number of units for both the voiceless unaspirated and the voiceless aspirated stops does not indicate any favoring or disfavoring for either type, and as such it neither validates nor

invalidates our analysis. Therefore, we have to look into the syntagmatic context for the usage of the opposing units with a view to ascertaining if the skewings observed there would conform to our expectations in terms of the human preference for phonological units with fewer articulatros over those with more articulators.

In Table II-6, we present the frequency of usage for the unaspirated and the aspirated within the voiceless stops, as they obtain in the monosyllabic words in Deccani Urdu.

Stops (Voiceless)	**CVC** No. %	**CVCC** No. %	**CCVC** No. %	**TOTAL** No. %
Unaspirated	775 79.16	89 95.70	4 100	868 80.67
Aspirated	204 20.84	4 4.30	0 0	208 19.33
Total	979 100	93 100	4 100	1076 100

Table II-6: Frequency of the Voiceless Unaspirated and the Voiceless Aspirated Stops in the Monosyllabic Words

Comments on Table II-6

Comment 1: As seen in the last column in the table, of the 1076 occurrences of the voiceless stops in the monosyllabic words, 868 occurrences are unaspirated and 208 are aspirated. That is, the voiceless unaspirated stops appear in a ratio of over 4 to 1 to the voiceless aspirated stops. This vast skewing in favor of the unaspirated and against the aspirated

among the voiceless stops, may well be attributed to the human preference for phonological units with fewer articulators over those with more articulators.

Comment 2: As shown in Table II-6, of the 979 occurrences of the voiceless stops in the CVC words, 775 occurrences are unaspirated and 204 are aspirated. That is, the unaspirated occurrences appear in a ratio of about 3¼ to 1 to the aspirated occurrences. This ratio for the unaspirated *versus* aspirated stops in the CVC words is very close to the ratio as it is observed for these opposing units in the monosyllabic words. And therefore the rationale for this vast skewing is the same as provided in comment 1 above.

Comment 3 Of the 93 occurrences of the voiceless stops in the CVCC words, 89 occurrences are unaspirated and only 4 aspirated. Here we find a drastic skewing with a ratio of over 22 to 1 in favor of the unaspirated and against the aspirated stops. This drastic tilt in favor of the unaspirated stops is partly brought about by the human preference for fewer over more articulators. At the same time, it may be noted that most of the CVCC words in Deccani Urdu are borrowed from Persian, a language that does not have any aspirated consonant.

Comment 4 As seen in the table, there are only 4 occurrences of the voiceless stops in the CCVC words. Although this number is insignificant for any statistical analysis, it is

noteworthy that the favored voiceless unaspirated stops are used in all the 4 occurrences. That is, there is a total skewing against the disfavored voiceless aspirated stops in the CCVC words.

Section A3: Velum as an Additional Articulator: Nasal *versus* Oral Vowels

In Deccani Urdu, as in modern standard Urdu, we have both nasal consonants and nasal vowels that are produced by the velum as the nasal articulator. Although the velum is traditionally considered a point of articulation, it is noteworthy that this supraglottal organ is sufficiently adroit to open and close the passage to the nasal cavity.

As seen in the phonological grid (Diagrm I-1), nasal consonants (m n N ñ ŋ) are produced by the velum at aperture 3, in combination with the relevant oral articulators (labium, apex-teetch, apex-palate, medium, dorsum, respectively) at aperture ∅, and the glottal articulator at aperture 1 (for voicing).

As compared to the voiced (unaspirated) stops (b d g etc.). the nasal consonants may seem to be more complex in that they are produced by three articulators--the relevant oral articulator, the velum (for the production of nasality), and the larynx or the glottal articulator (for the production of voicing). However the larynx should not be considered an additional, complicating articulator in the case of the nasal consonants.

For V(oice) is required for the excitation of the vocal cavity for all the phonological units (the "nasals", the "liquids", and the vowels) at aperture 3 and above. Therefore the nasal consonants may well be taken on a par with the voiced (unaspirated) stops in terms of the number of articulators.

√Again, as seen in the phonological grid (Diagram I-1), the nasal vowels (i:^{n} u:^{n} a:^{n} etc.) are produced by the velum, the nasal articulator at aperture 3, in combination with the relevant oral articulators--the medium ("front"), the front dorsum ("central"), and the back dorsum ("back")--at apertures 4 through 9, and the glottal articulator at aperture 1(for voicing). But it is noteworthy that the V(oice) is a necessary concomitant not only for the nasal vowels, but also for their oral counterparts. That is, both the oral vowels and the nasal vowels have an investment in V(oicing). That is why, the imposition of N(asality) through the velum as an extra articulator, makes the nasal vowels more complex than the oral vowels. In terms of human preference for simpler, less complex units, we therefore expect that the oral vowels should be preferred over the nasal vowels.

We now evaluate the impact of the velum as an additional articulator on the oral and the nasal vowels in the make-up of the vocalic units and their frequency of occurrence in the word, in Deccani Urdu.

As seen in the vocalic system of Deccani Urdu (Diagram I-3), there are 20 vocalic units in this dialect of Urdu, 10 oral and 10 nasal. Further, it may be noted that in view of their substantive characteristics, these 20 vocalic units may be divided into the long vowels (14) and the short vowels (6). Again, it is worth noting that of the 14 long vowels, 7 are oral (i: u: a: e: o: ɛ: ɔ:) and 7 nasal (i:^{n} u:^{n} a:^{n} e:^{n} o:^{n} ɛ:^{n} ɔ:^{n}). Likewise, the 6 short vowels comprise 3 oral (I A U) and 3 nasal (I^{n} A^{n} U^{n}). Thus, there is a complete parity in the number of units for oral vowels produced by fewer articulators and the nasal vowels produced by one additional articulator, the velum. It may be pointed out here that this parity in the number of vocalic units is neither in favor of nor against our expectations in terms of the human preference for simpler phonological units in any language.

Although the complexity produced by the velum as an additional articulator does not show up in the paradigmatic make-up of the nasal vowels *vis-a-vis* the oral vowels, we do encounter a vast skewing in favor of the oral vowels and against their nasal counterparts in their frequency of usage in the word. We now present the actual occurrences of these opposing vowels in Table II-7.

Vowels	CVC No.	%	CVCC No.	%	CCVC No.	%	TOTAL No.	%
Oral	1198	77.54	113	61.75	6	85.71	1317	75.91
Nasal	347	22.46	70	38.25	1	14.29	418	24.09
Total	1545	100	183	100	7	100	1735	100

Table II-7: Frequency of Oral and Nasal Vowels in the Monosyllabic Words

Comments on Table II-7

Comment 1: As seen in the last column in this table, of the 1735 vocalic occurrences in all the monosyllabic words, 1317 occurrences are oral and only 418 are nasal. That is, the simpler, oral vowels appear in a ratio of over 3 to 1 the more complex nasal vowels. This vast skewing in favor of the oral vowels and against the nasal vowels is justified in view of the use of an additional articulator, the velum, in the production of the nasal vowels.

Comment 2: The vast skewing in favor of the oral vowels and against the nasal vowels is further increased in the syntagmatically simple CVC words. As shown in the table, of the 1545 vocalic occurrences in the CVC words, 1198 (77.54%) occurrences are oral and only 347 (22.46%) are nasal. Again, this skewing perfectly conforms to our expectation in terms of the fewer *versus* more articulators and the syntagmatic simplicity of the CVC words.

Comment 3: Of the 183 vocalic occurrences, as shown in the CVCC column in the table, the nasal vowels (70) appear in a ratio of almost 2 to 3 in comparison with the oral vowels (113). Although even here, there is a clear skewing in favor of the oral vowels and against their nasal counterparts, it is also evident that the disfavored nasal vowels fare well in the syntagmatically complex CVCC words. (For further details, cf. Table II-8, comment 3 below.)

Comment 4: As shown in Table II-7, of the 7 vocalic occurrences in the CCVC words, there are 6 occurrences of the oral vowels and only 1 occurrence of the nasal. That is, we encounter a drastic skewing in favor of the oral vowels and against the nasal vowels here. Again, this rather extreme disfavoring for the nasal vowels may well be attributed to the use of the velum as an additional articulator.

We now present the actual occurrences of the oral *versus* nasal among the long vowels in the monosyallbic words in Deccani Urdu, in Table II-8.

Long Vowels	CVC No.	%	CVCC No.	%	CCVC No.	%	TOTAL No.	%
Oral	826	76.13	7	24.14	6	85.71	839	74.84
Nasal	259	23.87	22	75.86	1	14.29	282	25.16
Total	1085	100	29	100	7	100	1121	100

Table II-8: Frequency of Long Oral and Long Nasal Vowels

in the Monosyllabic Words

Comments on Table II-8

Comment 1: As seen in the last column in this table, of the 1121 long vocalic occurrences in all the monosyllabic words, 839 occurrences are long oral and only 282 are long nasal. That is, the simpler long oral vowels appear in a ratio of almost 3 to 1 the more complex long nasal vowels. This vast skewing in favor of the long oral vowels and against the long nasal vowels is brought about by the use of an additional articulator, the velum, in the production of the nasal vowels.

Comment 2: The vast skewing in favor of the oral and against the nasal among the long vowels, is further increased in the syntagmatically simple CVC words. As shown in the table, of the 1085 long vocalic occurrences in the CVC words, 826 (76.13%) occurrences are long oral and only 259 (23.87%) are long nasal. Again, this skewing perfectly conforms to our expectation in terms of the fewer *versus* more articulators and the syntagmatic simplicity of the CVC words.

Comment 3: As seen in Table II-8, of the 29 long vocalic occurrences in the CVCC words, there are only 7 instances of the simpler, less complex long oral vowels and 22 instances of the more complex long nasal vowels. This vast skewing in the ratio of over 3 to 1 in favor of the long nasal vowels and against the long oral vowels is contrary to our expectations in terms of the human trait of preferring simpler phonological

units. It is however noteworthy that all the 22 occurrences of the nasal vowels appear before a nasal consonant in the CVCC words. This usage may be illustrated by the following words:

Serial No.	Words	Form Class	Gloss
1.	ɔ:^{n}ŋg	V_i	doze
2.	pe:^{n}NT	N_m	paint
3.	ba:^{n}ŋg	N_f	crowing (of a cock)
4.	b^{h}a:^{n}ŋg	N_f	hemp plant; intoxicating drink made of the leaves of hemp
5.	d^{h}a:^{n}ŋg	V_t	mess (bedding etc.)
6.	Ta:^{n}ŋg	N_f	leg
7.	Ta:^{n}ŋg	V_t	hang
8.	Da:^{n}ns	N_m	dance
9.	D^{h}o:^{n}ŋg	N_m	deceit, fraud
10.	ja:^{n}ŋg	N_f	thigh
11.	Kɛ:^{n}mp	N_m	camp
12.	gɛ:^{n}ŋg	N_m	gang
13.	ma:^{n}ŋg	N_f	hair-parting
14.	ma:^{n}ŋg	N_f	demand
15.	ma:^{n}ŋg	V_t	beg, ask
16.	mu:^{n}ŋg	N_f	kind of pulse

17.	si:^{n}ŋg	N	horn
18.	su:^{n}ŋg	V_i/V_t	smell, sniff, inhale
19.	hi:^{n}ŋg	N_m	asofoetida
20.	la:^{n}ŋg	V_t	jump (over)
21.	lɔ:^{n}ŋg	N	clove; nosepin
22.	re:^{n}ŋg	V_t	creep

The rationale for the use of the more complex nasal vowels before the nasal consonants will be provided, when we deal with the assimilative trait of neighboring phonological units later in this chapter.

Comment 4: As shown in Table II-8, of the 7 long vocalic occurrences in the CCVC words, there are 6 occurrences of the long oral vowels and only 1 occurrence of the long nasal. That is, we encounter a drastic skewing in favor of the long oral vowels and against the long nasal vowels here. Again, this rather extreme disfavoring for the long nasal vowels may well be attributed to the use of the velum as an additional articulator.

The actual occurrences of the oral *versus* nasal among the short vowels in the monosyallbic words in Deccani Urdu are presented in Table II-9.

Short Vowels	CVC No.	%	CVCC No.	%	CCVC No.	%	Total No.	%
Oral	372	80.87	106	68.83	0	0	478	77.85
Nasal	88	19.13	48	31.17	0	0	136	22.15
Total	460	100	154	100	0	0	614	100

Table II-9: Frequency of Short Oral and Short Nasal Vowels in the Monosyllabic Words

Comments on Table II-9

Comment 1: As seen in the last column in this table, of the 614 short vocalic occurrences in all the monosyllabic words, 478 occurrences are oral and only 136 occurrences are nasal. That is, the simpler oral vowels appear in a ratio of over 3½ to 1 the more complex nasal vowels. This vast skewing in favor of the short oral vowels and against the short nasal vowels is justified in view of the use of an additional articulator, the velum, in the production of the nasal vowels.

Comment 2: The vast skewing in favor of the long oral vowels and against the long nasal vowels is further increased in the syntagmatically simple CVC words. As shown in the table, of the 460 short vocalic occurrences in CVC words, 372 (80.87%) occurrences are short oral and only 88 (19.13%) are short nasal. Again, this skewing perfectly conforms to our

expectations in terms of the fewer *versus* more articulators and the syntagmatic simplicity of the CVC words.

Comment 3: Of the 154 short vocalic occurrences, as shown in the CVCC column in the table above, the short nasal vowels (48) appear in a ratio of almost 1 to 2¼ in comparison with the oral vowels (106). Again, this skewing clearly conforms to our expectation in terms of the human trait of preferring fewer articulator over more articulator.

Section B: Proximate Place of Articulation *versus* Remote Place of Articulation

The apex of the tongue being the most adroit among all the supraglottal articulators, can come in contact with various places (or points) of articulation, to produce apico-interdental, apico-dental, apico-alveolar or apico-palatal consonants in a variety of languages. Thus, the tip of the apex as an articulator comes in between the upper and the lower teeth to produce the interdental fricatives in English, represented by "th" in thin and then. The apex also comes in contact with the inner side of the upper teeth to produce the apico-dental t d in French and Urdu. The apex is also used to produce apico-alveolar stops, such as t d in English, with the alveolar ridge as the place of articulation. Finally the apex can be curled back to hit the hard palate to produce the apico-palatal (or "retroflex") consonants in Urdu and some other Indian languages.

Further, in Deccani Urdu, as in modern standard Urdu and in some other Indian languages, the apex of the tongue can come in contact with two separate places (or points) of articulation, namely, the teeth and the hard palate, to form two distinctive series of consonants--the apico-dental and the apico-palatal, traditionally known as the "dental", and the "retroflex" consonants, respectively. (Cf. Chapter I, section B.)

In the production of the apico-dental consonantal units, the apex comes in contact with the upper teeth. As the inner side of the upper teeth is directly faced by the tip of the tongue, the upper teeth are the ideal target of the apex. Therefore, it is easier to produce apico-dental ("dental") consonants.

In contradistinction to the apico-dental consonants, the production of apico-palatal ("retroflex") consonants requires a difficult maneuvering of the apex. The tip of the tongue has to be curled back to an almost semicirular position to hit the hard palate. Thus, it is relatively difficult to produce the apico-palatal consonants. In terms of the human preference for the economy of effort, we therefore expect that within the apical consonants, the apico-dentals would be preferred over the apico-palatal consonants.

As seen in Diagram I-1, and Table I-1, of the 8 apical stops at aperture ∅ in Deccani Urdu, there are 4 apico-dental (t t^h d d^h) and 4 apico-palatal (T T^h D D^h). That is, there is a

parity in the number of units between the two opposing stop types. But it may be noted that this parity is neither in favor of nor against our expectation with regard to the favoring and disfavoring for the two types of the apical stops.

Of the two apical nasal units (n N) that are produced simultaneously at oral aperture ϕ and nasal aperture 3, n is apico-dental and N is apico-palatal. Here again we find a parity in the number of units. Again, this parity is neither against nor in favor of our expectation. It may however be noted that the apico-palatal N is a positional variant that can only appear as the first member of a consonant cluster, when the second member of that cluster is an apico-palatal consonant.

Of the two apical fricatives (s and z) at aperture 2, both of them are apico-dental. That is, we encounter a <u>total</u> skewing in favor of the apico-dentals and against the apico-palatals. The absence of any apico-palatal fricatives in the phonological paradigm of Deccani Urdu may well be attributed to the human trait of avoiding the difficult task of producing any "retroflex sibilants" at aperture 2. It is noteworthy that the "retroflex sibilant" s did exist in Sanskrit. However, it has totally been eliminated in Urdu and Hindi.

Among the <u>5</u> apical liquids that appear at aperture 3, there are only <u>2</u> apico-dental (l r), and <u>3</u> apico-palatal L R R^h).This disparity in the number of units between the apico-

dental and the apico-palatal liquids is contrary to our expectations. It may however be noted that the apico-palatal L is only a marginal phonological unit that does not occur at all in the monosyllabic words being used for the statistical analysis in the present research. Further, the apico-palatal R^h is a positional variant that appears only in the final position of the monosyllabic words. In contrast, the apico-dental l and r are the most productively utilized phonological units in Deccani Urdu.

In the light of the discussion above, we can reasonably assume that despite some problems with regard to the number of units, the apico-dental consonants are actually favored over the apico-palatal consonants in the Deccani dialect of Urdu.

Now we present the frequency of occurrences of the opposing apico-dental and apico-palatal consonants in Table II-10, to evaluate the impact of the human trait pertaining to the proximate *versus* remote point of articulation.

Consonants	CVC		CVCC		CCVC		TOTAL	
	No.	%	No.	%	No.	%	No.	%
Apico-Dental	1080	76.33	226	87.94	7	100	1313	78.2
Apico-Palatal	335	23.67	31	12.06	0	0	366	21.8
Total	1415	100	257	100	7	100	1679	100

Table II-10: Frequency of Apico-Dental and Apico-Palatal Consonants in the Monosyllabic Words

Comments on Table II-10

Comment 1: As seen in the last column of the table above, of the 1679 occurrences of the apical consonants in the monosyllabic words, 1313 are apico-dental whereas only 366 are apico-palatal. That is, the apico-dental consonants appear in a ratio of over 3½ to 1 to the apico-palatal consonants. This vast skewing in favor of the apico-dental and against the apico palatal units in the over-all usage of the opposing consonants in the word, is brought about by the human trait of favoring consonantal units with proximate point of articulation over those with the remote point of articulation.

Comment 2: As shown in the column for CVC words, of the 1415 occurrences of the apical consonants, there are 1080 occurrences of the apico-dental and only 335 occurrences of the apico-palatal. This vast skewing, appearing in a ratio of over 3 to 1, in favor of the apico-dental consonants and against the apico-palatal consonants may again be attributed to the human trait pertaining to the proximate *versus* remote point of articulation.

Comment 3: As seen in the CVCC column in the lable above, of the 257 apical occurrences in the monosyllabic words, 226 are apcio-dental and only 31 are apico-palatal. That is, the apico-dental consonants appear in a ratio of over 7 to 1 to the apico-palatal consonants. This drastic skewing in favor of the apico-dental and against the apico-palatal consonants, is

partly brought about by the human trait of preferring the proximate place of articulation over a remote place of articulation. At the same time, it may be noted that most of the CVCC words in Deccani Urdu are borrowed from Persian, a language that does not have any "retroflex" consonantal units.

Comment 4: As seen in Table II-10, all the 7 apical occurrences in the CCVC words, are apico-dental. Although this number is statistically insignificant, it may not be coincidental that there is a total skewing in favor of the favored apico-dental consonants and against the disfavored apico-palatal consonants.

In Table II-11, we present the frequency of occurrence in the monosyllabic words for the opposing apico-dentals *versus* apico-palatals for the stops, the nasals, the fricatives, and the liquids separately, with a view to evaluating the impact of the human trait of preferring proximate place of articulation over the remote place of articulation.

Cons-onants	Stops No.	%	Nasals No.	%	Fricatives No.	%	Liquids No.	%	Total No.	%
Apico-Dentals	370	57.9	194	95.1	281	100	468	84.32	1313	78.20
Apico-Palatal	269	42.1	10	4.9	0	0	87	15.68	366	21.80
Total	639	100	204	100	281	100	555	100	1679	100

Table II-11: Frequency of Apico-Dental *versus* Apico-Palatal Stops, Nasals, Fricatives, and Liquids

in the Monosyllabic Words

Comments on Table II-11

Comment 1: As seen in the table above, of the 639 stop occurrences in the monosyllabic words for the apicals, 370 occurrences are apico-dental and 269 apico-palatal. That is, there is a clear skewing, in a ratio of over one third to one, in favor of the apico-dental stops and against the apico-palatal stops. This moderate skewing is fully justified in terms of the human trait of preferring apico-dental consonants formed at the proximate place of articulation, over the apico-palatal consonants formed at a remote place of articulation.

Comment 2: As shown in the column for nasal consonants in Table II-11, of the 204 apical nasal occurrences in the monosyllabic words, there are 194 apico-dental nasals and only 10 apico-palatal nasals. That is, the apico-dental nasals appear in a ratio of over 19 to 1 to the apico-palatal nasals. This drastic skewing in favor of the apico-dentals and against the apico-platals is partly brought about by the human trait of preferring the proximate place of articulation over the remote place of articulation. Further, it is noteworthy that unlike the apico-dental n, which is a distinctive phoneme, the apico-palatal N is a positional variant that appears in the CVCC words only as the first member of a consonant cluster, when the second member of that cluster is an apico-palatal consonant.

Comment 3: As seen in the column for the fricatives in the table above, all the 281 apical occurrences in the monosyllabic words, are apico-dental with a total skewing against the apico-palatal. As we have explained earlier in this section, no apico-palatal fricative is established as a unit in the phonological paradigm of Deccani Urdu.

Comment 4: As seen in the column for the liquids in Table II-11, of the 555 appearances of the apical liquids in the monosyllabic words, there are 468 instances of the apico-dentals, and only 87 instances of the apico-palatals. That is, the apico-dental liquids appear in a ratio of almost 5½ to 1 to the apico-palatal liquids. This vast skewing in favor of the apico-dental liquids and against the apico-palatal liquids can primarily be justified in terms of the human trait of preferring phonological units produced at proximate place of articulation over those produced at some remote place of articulation. Further, the tilt in favor of the favored apico-dental liquids is reinforced by two other principles based on physiology and communication. In fact, as we have noted earlier in this section, the apico-dental liquids (l r) are the most productively utilized consonantal units in Deccani Urdu. In contradistinction to the apico-dental liquids, the apico-palatal liquids (L R R^h), though greater in the number of units, are highly disfavored. As noted earlier, L is a marginal

phonological unit rarely used in the Deccani dialect of Hyderabad, and R^h is a positional variant in this dialect.

Section C: Assimilative Trait of Neighboring Phonological Units

The syntagmatic organization of the phonological units of a language is often motivated by the assimilative trait of neigboring phonological units. For the characteristics of neighboring segments tend not to be precisely differentiated.

It is noteworthy that the phonological units of a language that combine to form signal-meaning units (*signes*), are marked by distinction of articulator, points of articulation, aperture, relative adroitness of articulators and their muscular tension. Further, the phonological units may also differ in terms of certain other articulatory features, such as V(oicing), A(spiration), or N(asality).

For example, st share two features of articulation, namely, articulator (apex) and voicelessness. Whereas gt, on the other hand, do not share these features for g is a front dorsal voiced unit, and t is a voiceless apical unit. It is to be noted that if two successive phonological units (e.g., gt) are very different from each other, then fine and precise manipulation of articulators are required to distinguish these segments. However, if two successive phonological units (e.g., st) that share some features of articulation, are combined, then it is easier to carry on without such precise

manipulation of articulators. Thus, in view of the general avoidance of fine and precisely coordinated movement of articulator, we expect that there will be a favoring for the combination of phonological units which share some features of articulation.

The impact of assimilative trait is manifest in the combination of phonological units in the word. The fine, precisely coordinated movement of the articulator is avoided by making certain phonological changes in the neighboring phonological units. As a result of these changes, the neighboring segmet become similar.

With a view to evaluating the impact of assimilative trait, we compare the occurrences of the phonological units in the monosyllabic words of Deccani Urdu, in following section.

Section C1: Assimilative Trait and the Occurrence of the Phonological Units

We now present the occurrence of voiceless, voiced and nasalized phonological units, as they appear in the monosyllabic (CVC and CVCC) words in Deccani Urdu.

1. Initial Voiceless Stop + Final Voiceless Stop.

   Total Number of Words = 192

2. Initial Voiced Stop + Final Voiced Stop

   Total Number of Words = 72

3. Initial Voiceless Stop + Final Voiced Stop

Total Number of Words = 42.

4. Initial Voiced Stop + Final Voiceless Stop

Total Number of Words = 111

5. Initial Voiceless Fricative + Final Voiceless Fricative

Total Number of Words = 19

6. Initial Voiced Fricative + Final Voiced Fricative

Total Number of Words = 2

7. Initial Voiceless Fricative + Final Voiced Fricative

Total Number of Words = 5

8. Initial Voiced Fricative + Final Voiceless Fricative

Total Number of Words = 7

As seen in the CVC words, of the 417 stop occurrences, initial voiceless stops plus final voiceless stops appear in 192 words, initial voiced stops plus final voiced stops in 72, initial voiceless stops plus final voiced stops in 42, and initial voiced stops plus final voiceless stops in 111. That is, the combination of physiologico-acoustically simpler and similar phonological units (initial voiceless stops plus final voiceless stops) is preferred over the combination of more complex and similar units (initial voiced stops plus final voiced stops) which is perfectly in conformity with our expectation. It may however be noted here that the greater number of initial voiced stops plus final voiceless stops (111) *vis-a-vis* initial voiced stops plus final voiced stops (72) is against our expectation in terms of the assimilative trait of neighboring

phonological units. The rationale for this sharp skewing in favor of the voiced voiceless combination is brought about by the joint interaction of communication with the human trait of preferring fewer articulator over more articulator.

Of the 33 occurrences of fricatives in the CVC words, the combination of initial voiceless fricatives plus final voiceless fricatives appear in 19 words, initial voiced fricatives plus final voiced fricatives in 2 words, initial voiceless fricatives plus final voiced fricatives in 5 words, and initial voiced fricatives plus final voiceless fricatives in 7 words. That is, the initial and final voiceless combination (19) is highly preferred over the initial and final voiced combination (2) which is perfectly in conformity with our expectation in terms of assimilative trait. The rationale for the unexpected skewing in favor of the voiceless-voiced combination (5) and voiced-voiceless combination (7), and against the voice combination (2), is again brought about by the joint interaction of communication with the human trait of preferring fewer articulator over more articulator.

The actual occurrence of the final consonant cluster in the CVCC words of Deccani Urdu are now presented below.

1. Voiceless Fricative + Voiceless Stop

Total Number of Words = 27

2. Voiced Fricative + Voiced Stop

Total Number of Words = 3

3. Voiceless Fricative + Voiced Stop

Total Number of Words = 0

4. Voiced Fricative + Voiceless Stop

Total Number of Words = 0

As seen in the CVCC words, of the 30 final consonant clusters, the combination of voiceless units appears in 27 words, and the combination of voiced units obtains in 3 words, whereas the combination of voiceless-voiced or voiced-voiceless has 0 occurrence in Deccani Urdu. That is, in final clusters, we observe a preference in the occurrence of voiceless units with voiceless units over voiced units with voiced units. Further, 0 occurrence for voiceless-voiced and voiced-voiceless combinations is fully motivated by the assimilative trait of neighboring phonological units.

Further, nasal consonants in final cluster in the CVCC words combine most frequently with voiced stops (53) *vis-a-vis* voiceless stops (11) in Deccani Urdu, which is again motivated by assimilative trait.

The impact of assimilative trait can also be seen in the occurrence of nasalized vowels in the CVC and the CVCC words in Deccani Urdu. In CVCC words, all vowels that appear before nasal consonants are nasalized. In the CVC words, we also encounter a favoring for nasalized vowels before nasal

consonants. The actual occurrence of the nasalized vowels in the CVC words of Deccani Urdu is presented below.

[3]Type	Number of Words
CV^nC	126
CV^nN	177
NV^nC	26
NV^nN	14

Section C2: Ad Hoc Phonological Change and Assimilative Trait

In Deccani Urdu, we encounter an ad hoc phonological change as a result successive phonological unit becomes similar. For example, classical Urdu b̲ becomes p̲ in Deccani Urdu.

Classical Urdu	Deccani Urdu
zAbt	zApt
XAbt	XApt

As seen in the above listed words, the voiced stop b̲ that appears before voiceless stop t̲, becomes voiceless stop p̲. The loss of voicing in this case makes the neigboring segment similar, which is clearly motivated by assimilative trait.

---

[3] C = any consonant
V^n = any nasalized vowel
N = any nasal consonant

Section D: Aperture Change and Combination of Phonological Units

In this section, we examine the syntagmatic organization of phonological units of Deccani Urdu in view of the claim that in successive segments, large changes of aperture are preferred over small changes of aperture.

The phonological units of a language or dialect cohere to form greater segments. The larger changes of aperture are likely to be preferred in successive segments. For it provides greater freedom of movement for articulators and therefore less precision of control is required in the articulation of these segments. The segments produced by small changes of aperture, on the other hand, involve greater precision of control. Thus, there is a general disfavoring for small changes of aperture.

The impact of the degree of aperture change on the combinatory pattern of Deccani Urdu phonological units in the monosyllabic words is taken up in the following subsection.

Section D1: Large Aperture Change *versus* Small Aperture Change: CVC *versus* CVCC and CCVC Words

In this section, we compare the potential and the actual number of CVC, CVCC, and CCVC words to validate the claim that large changes of aperture are preferred over small changes of aperture. The potential and the actual number of CVC, CVCC, and CCVC words are presented in Table II-12.

Type	Potential	Actual
CVC $C^2V = 40^2 \times 20$	32000	1545 4.83% (of potential)
CVCC $C^3V = 40^3 \times 20$	1280000	183 .014% (of potential)
CCVC $C^3V = 40^3 \times 20$	1280000	7 .00054% (of potential)
Total	2592000	1735
Total Number of Deccani Urdu Consonants: 40 Total Number of Deccani Urdu Vowels: 20		

Table II-12 Potential and Actual Number of Monosyllabic Words in Deccani Urdu

Comments on Table II-12

Comment 1: As shown in the table above, the total number of consonants for Deccani Urdu is 40, and the total number of vowels is 20. Given the total number of consonants (40) and vowels (20), the potential number of the CVC words is 32000 whereas the actual turn-out is 1545 (4.83% of 32000).

For CVCC and CCVC words, as seen in the table, the potential number is 1280000, but their actual turn-outs are much lower than the CVC words. The actual number of CVCC and CCVC words is 183 (.014% of 1280000) and 7 (.00054% of 1280000), respectively. Even a cursory glance at the table for the actual and the potential number of CVC, CVCC and

CCVC words shows that there is a clear preference for the CVC words, because CVC words appear in absolute majority.

Comment 2: The preference for the CVC words is brought about by the maximum change of aperture in successive segments. In CVC words, there is a maximum change of aperture from constriction (0,1,2,3) to opening (4,5,6,7,8,9), then back to constriction. In the CVCC and CCVC words, on the other hand, the initial and the final clusters demand for smaller changes of aperture (from consonant to consonant). Therefore, the CVC words which involve large changes of aperture in the successive segments are preferred over the CVCC and the CCVC words in Deccani Urdu, as in many other language or dialect.

Section E: Human Behavior Justification for the Phonological Grid of Deccani Urdu

As discussed earlier (cf. Chapter I), the phonological grid of Deccani Urdu (Diagram I-1), is primarily established by physiological mechanism and communication. However, besides these two orientations, human behavior and acoustic medium also play a role in the formation of the phonological grid. In this section, therefore, we take up those human behavior (psychological) factors which provide reinforcement to the validity of the phonological units in Deccani Urdu.

It is generally agreed that the principle laid down below represents a common trait of human behavior:

"It is easier to learn the use of a smaller number of tools than of a larger,and up to a certain point it is easier to learn to perform a given task of combining the resources of tools with which one is familiar than by learning the use of a new tool".

Thus, in view of the above, the make-up and the distribution of the phonological units of a language are motivated as follows;

"It is well-known that phonological system tend to be organizations of a relatively small number of units used in varying combinations, rather than collection of a relatively large number of non-combining phonological units".

It is to be noted that there are 60 phonological units in Deccani Urdu. Of the 60 units, 40 are consonantal and 20 vocalic (Cf. Diagram I-1). It is these rather small number of distinct units which recur in different permutations and combinations to form the entire inventory of signals of the signal-meaning pairs (*signes*) of this Deccani dialect of Urdu. This is, one way in which human language minimizes the effort on the specific part of the memory. The economy so achieved in the formation of singals, is actually developed by Andre Martinet under "double articulation".

Furthermore, the total bulk of phonological units is formed by the combination of a relatively small number of articulators and apertures. For we have only 7 articulators

(labium, apex, medium, front dorsum, back dorsum, velum and glottis) and 11 degrees of aperture (∅,1,1½,2,3,4,5,6,7,8, and 9) for Deccani Urdu.

In fact, whereas both physiology and human behavior contribute significantly to the asymmetrical nature of the phonological grid, it is only the human factor that is taken up here. The physiologico-acoustically simpler, less complex phonological units that are produced with less effort, outnumber more complex units which require more effort in their production.

Even a quick look at the phonological grid, reveals that there is a lack of symmetry in the number of units on the various intersections of axes. It is beyond the scope of the present research to explain the absence of each and every potential phonological units in Deccani Urdu. Thus, we will provide justification only for those holes or gaps that are found relative to some existing phonological units in the grid. (Cf. Diagram I-1.)

1. Scarcity of the Phonological Units at Aperture 1

There are only 2 phonological units, f and v that appear at apertur 1 as opposed to 5 units at aperture 2. For the perforated surface of the teeth is ideally suited to produce fricatives by releasing air stream through a very restricted channel whereas the palate or the lip as place of articulation provide air tight contact which is not suitable for the

production of fricatives. Therefore, members of the first degree of aperture using the teeth as place of articulation are preferred to those using the palate (or the lip) as place of articulation.

2. Absence of the Voiced Counterpart of the Voiceless Medial Fricative at Aperture 2

As seen in the phonological grid (Diagram I-1), a voiceless medial fricative ʃ does occur in Deccani Urdu which is recognized by the absence of its voiced counterpart at aperture 2. The non-occurrence of the more complex voiced fricative with medial articulator can partly be attributed to the use of more articulator (glottis for voicing).

3. Two Axes for Apex in Opposition to One Each for Other Articulator

The human behavior interplay is clearly visible in the asymmetrical use of articulators in the formation of phonological units. Of all the supraglottal articulators, the most adroit apex is conveniently utilized to make dual distinction between the "dental" and the "retroflex" among the consonants by the speakers of many Indian languages.

On observing the phonological grid of Deccani Urdu (Diagram I-1), it is clear that the apex keeps distinction of articulation at two points, namely, the dental and the palatal, at aperture ∅ and 3. The use of apex on two distinct points is

due to the greater adroitness of apex among all the lingual articulators (medium, dorsum).

It is therefore concluded that the human behavior orientation provides reinforcement to the validity of the phonological grid of Deccani Urdu, which is established earlier in terms of physiological mechanism.

Section F: Summary and Conclusions

In this section, we summarize our findings as a whole, in terms of human behavior orientation, dealt within this chapter. Here an attempt has been made to explain both the paradigmatic and the syntagmatic aspects of distribution of the phonological units.

In section A, we have dealt with the preference of fewer articulators over more articulators in the production and distribution of phonological units. The three main dichotomies among the phonological units of Deccani Urdu brought about the by the use of an extra articulator, are Voiced *versus* Voiceless consonants, Aspirated *versus* Unaspirated among the voiceless stops, and Nasal *versus* Oral vowels. Further, in view of the preference for fewer articulator, we predicted that the voiceless consonants over the voiced, the unaspirated stops over the aspirated, and the oral vowels over the nasal, should be favored. And we have successfully demonstrated through the actual counts that the paradigmatic and the

syntagmatic distribution of phonological units clearly conforms to our expectations.

In section B, we have analyzed the relation between the apico-dental ("dental") consonants with the proximate place of articulation and the apico-palatal ("retroflex") consonants with the remote place of articulation. As it is easier for the apex to come in contact with the adjacent place of articulation (the teeth) than the distant place of articulation (the palate), the production of apico-dental consonants involves less human effort. Thus, we predicted that the apico-dental consonants should be preferred over apico-palatal consonants, both in the number of units and in their frequency of usage in the word in Deccani Urdu, as in any other language or dialect. It has been successfully demonstrated through actual counts that both the paradigmatic and the syntagmatic distribution of phonological units fully conforms to our expectations.

In section C, we have evaluated the impact of the assimilative trait of neighboring phonolgoical units that are manifest in the combinatory phonology of Deccani Urdu. As noted, the fine and precisely coordinated movement of the articulator is avoided by making certain phonological changes in the neighboring phonological units. Thus, in view of the general avoidance of fine, precisely coordinated movement of articulator, we predicted that there should be a favoring for the combination of units that become similar. For example, the

voiceless unit should preferably occur with voiceless unit, and voiced unit should preferably combine with voiced unit. It has been amply demonstrated through the actual frequency counts that the syntagmatic distribution of phonological units is clearly motivated by assimilative trait, and therefore this skewed distribution fully conforms to our expectations.

In section D, we have examined the impact of the degree of aperture change on the combinatory pattern of Deccani Urdu. It has been argued that large changes of aperture which require less precision of control are preferred. We therefore compared the potential and the actual number of CVC, CVCC, and CCVC words and demonstrated clearly that the CVC words which involve large changes of aperture are drastically favored. This is perfectly in conformity with our expectations.

In section E, we have shown that human behavior orientation provides reinforcement to the validity of phonological units in the grid (Diagram I-1), established earlier in terms of physiological mechanism in Chapter I. The phonological skewings in the grid have been explained in view of human preference for the physiologico-acoustically simpler, less complex phonological units. Further, it has been argued that the perforated nature of the teeth is ideally suited for the production of fricatives at aperture 1 whereas palate or upper lip makes tight contact at this aperture. Thus, only two phonological units (f v) which are conveniently articulated,

appear at this aperture. Furthermore, we have also justified the use of the most adroit apex to make the dual distinction between the "dental" and the "retroflex" among the consonants ("stops" and "liquids"), in Deccani Urdu.

To conclude:

(1) The phonological units produced by fewer articulators are preferred over those produced by more articulators. For, the use of an extra articulator requires additional effort on the part of speaker which is disfavored in terms of human behavior. As a result, the voiced over the voiceless among unaspirated stops, voiced fricatives over voiceless fricatives, aspirated over unaspirated among the voiceless stops, and nasal vowels over oral vowels are disfavored because all of them involve an extra articulator.

(2) The apico-dental ("dental") consonants with the proximate place of articulation are preferred over the apico-palatal ("retroflex") consonants with the remote place of articulation, both in the number of units and in the frequency of usage.

(3) The neighboring phonological units become similar in view of the assimilative trait to avoid fine precisely coordinated movement of articulator.

(4) The large changes of aperture are preferred over small changes of aperture. A comparison of CVC, CVCC and CCVC,

words is made through frequency counts to show that the CVC words are highly preferred.

(5) The reinforcement of the validity of the phonological units in the grid, is further justified in terms of the human behavior orientation.

CHAPTER III
ROLE OF COMMUNICATION IN THE PHONOLOGY OF DECCANI URDU

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It is not novel to say that language is a device of communication. Rather novelty lies in claiming that the very make-up and structure of the language are directly motivated by communication. The communicative principle dictates that, as far as possible, all the intersections of the phonological paradigm be filled by phonological units. Altenatively, an axis of the paradigm may be totally eliminated, if it is filled by just one phonological unit. Thus, notwithstanding the human preference for the physiologico-acoustically simpler, less complex phonological units, language do have complex, disfavored units, in their phonological paradigm. For in case of the number of units in the phonological paradigm of a language, the physicologico-acoustic and human traits are often sidelined by the powerful impact of communication.

Futher, it may be noted that the communicative principle also motiavtes the combinatory pattern of a language. It is generally agreed that the beginning of the word carries greater communicative load *vis-a-vis* the end of the word. In view of this communicative rationale, we predict that a greater number of phonological units will be utilized in word initial

position, whereas there will be a selective under-utilization of the phonological units of a language in word find position.

Finally, it is worth noting that whether to consider communication as a controlling factor in the structure of language, has been a point of disagreement among scholars. Nevertheless, it is agreed that communication is the controlling factor in grammar. For Ferdinand de Saussure's concept of *signe* (significant and signifie) is clearly based on communication. Likewise, this signal-meaning relationship within the language is also suggested by Bloomfield's minimal units of form and minimal units of meaning. However, for phonology, the traditional phonemicists have argued that communication is not a controlling factor at all.

The incorporation of meaning in the phonological analysis was made through the concept of "funtional load" and "functional yeild" by Andre Martinet. (Cf. Martinet 1955:193.) He claims that function plays significant role in the make-up of the phonological structure. He further states that the factors of functional importance exert influence on both the paradigmatic and the syntagmatic aspect of phonological units.

It may parenthetically be noted that as the term "function" is loaded with various connotations, the term communication is used instead in Columbia school of linguistics.

The phonological analysis of Deccani Urdu in terms of communication, as presented in this chapter, contains five sections. In section A, we gauge that effect of communication on the paradigm of phonological units. In section B, we evaluate the impact of communication on the syntagmatic distribution of the phonological units in Deccani Urdu. In section C, we briefly deal with the phonological merger. And in section D, we take up homonymy as a communicative problem. Finally in section E, we present summary and conclusions.

Section A: Impact of Communication on the Paradigmatic Make-up of Phonological Units

In this section, we study the impact of communication on the paradigm of phonological units in Deccani Urdu.

In Chapter I, we have presented the paradigmatic make-up of phonological units (Diagram I-1) in terms of physiological mechanism. Further, it has also been mentioned there that the phonological units are primarily determined on the basis of distinctiveness in meaning (communication). It may be noted that the phonological units presented in the grid include all the phonemes plus allophones which fall at the intersections of relevant axes of articulators and apertures. Therefore, we postulate 60 phonological units for Deccani Urdu, of which 56 are phonemes and 4 positional variants.

The 56 phonological units established with an implicit use of the "phoneme" principle in Chapter I, are here explicitly established through meaning contrast in minimal and subminimal pair of words. It should be emphasized here that the "phoneme" principle, based on the distinctiveness of meaning, may be considered one manifestation of the communicative orientation of language.

In section A1, we present the "phonemic inventory" of Deccani Urdu. This "inventory" is justified through phonemic contrast in section A2.

Section A1: The Phonemic Inventory of Deccani Urdu

The 56 phonemes of Deccani Urdu are presented in the "phonemic inventory" (Diagram III-1). It may be noted here that in the presentation of the "inventory", we are not following the concepts like "pattern congruity" or "economy" that are associated with it in traditional American phonemics. We are interested in the "phonemic inventory" for the simple reason that all of the "phonemes" presented in it are communication based phonological units.

Consonantal Phonemes

Points of Articulation	Bilabial	Labio Dental	Dental	Retro-flex	Palatal	Velar	Glottal
Manner of Articulation							
Stops	p, b, p^h, b^h		t, d, t^h, d^h	T, D, T^h, D^h	C, j, C^h, j^h	k, g, k^h, g^h	
Fricatives		f, v	s, z		ʃ	x, ɣ	h
Nasals	m		n			ŋ	
Lateral			l				
Rolled			r				
Flapped				R			
Semivowels	w				y		

Vowels Phonemes

	Class I: Short Vowels			Class II: Long Vowels		
Oral	Front Unrounded	Central Unrounded	Back Rounded	Front Unrounded	Central Unrounded	Back Rounded
High				i:		u:
Lower-high	I		U			
Higher-mid				e:		o:
Mean-mid		A				
Lower-mid				ɛ:		ɔ:
Low					a:	
Nasal						
High				$i:^n$		$u:^n$
Lower-high	I^n		U^n			
Higher-mid				$e:^n$		$o:^n$
Mean-mid		A^n				
Lower-mid				ɛ:		$ɔ:^n$
Low					$a:^n$	

Diagram III-1: The Phonemic Inventory of the Deccani Urdu of Hyderabad

Comments on the Phonemic Inventory:

(1) The "phonemic inventory" differs in its make-up when compared with the phonological grid (Cf. Diagram I-1).

(2) The consonantal phonemes in the "phonemic inventory" are classified on the basis of manner of articulation and place (points) of articulation. However, the vowel phonemes are

classified in terms of the height of the tongue raised, part of the tongue raised, and the position of the lips.

(3) As presented in the "inventory" the consonants are divided on the basis of manner of articulation into stops, fricatives, nasals, lateral, rolled, flapped and semivowels. In terms of points of articulation, on the other hand, they are classified into bilabials, labio-dentals, dentals, retroflexes, palatals, velars and glottal.

(4) The vocalic phonemes can be divided into two classes: long vowels and short vowels.

(5) The "phonemic inventory" presents a list of all the "phonemes" of Deccani Urdu. Its importance is limited merely to listing of "phonemes". The "phonemes" are not in a way tied with one another in terms of value. They do project some substance, which is indicated by reference to points of articulation and manner of articulation. An "inventory" is basically a convenient device to present the "phonemes" in a diagram.

Section A2: Phonemic Contrast

The "phonemes" or the individual phonological units are established on the basis of contrasts in minimal and subminimal pair of words, resulting in a change of meaning. To establish contrasts, we have employed some randomly collected bisyllabic and longer words besides utilizing monosyllabic words.

It is to be noted that in our presentation of the "phonemic contrasts", we have taken up the consonantal contrasts first followed by the vocalic contrasts. Furthermore, the contrast of individual units is restricted only to those units that are closely opposed to each other. Nevertheless, in principle the individual units are interrelated with all other units in the grid.

Finally, it may be pointed out that the phonemic contrasts are restricted to the communicatively important initial position of the word. However, we have tried to provide pair of words for all the three positions viz, initial, medial, and final. For vocalic contrasts, on the other hand, we can have only one position in the monosyllabic words treated here.

Section A2(a): Consonantal Contrasts

Here we present the contrasts of Deccani Urdu consonants in the minimal and subminimal pairs.

(i) Four Stop Types Contrasted:

Contrast	**Initial/Gloss**	**Medial/Gloss**	**Final/Gloss**[4]
p p^h b b^h			
p/p^h	pe:T		
	stomach, belly		
	p^he:T		
	mix		

[4] For form classes and further details of meaning of monosyllabic words see glossary.

p^h/b^h	$p^h\varepsilon$:l	Up^{h}a:r	
	initiation	prize	
	$b^h\varepsilon$:l	Ub^{h}a:r	
	be amused	prominence	
p/b	pa:t	ApAs	ta:p
	leaf	order	heat
	ba:t	AbAs	ta:b
	talk	pause, suspension	strength
b/b^h	ba:g		
	reign		
	b^ha:g		
	run away		
t t^h d d^h			
t/t^h	tA^{n}n		sa:t
	body		seven
	t^{h}A^{n}n		sa:t^h
	udder		together
t^h/d^h	t^{h}A^{n}n		
	udder		
	d^{h}A^{n}n		
	wealth		
t/d	ta:b	bAtA^{n}n	a:t
	strength	womb	infinite
	da:b	bAdA^{n}n	a:d
	press down	body	half

d/dh	dA^nm	
	breath	
	d^hA^nm	
	thud	

T T^h D D^h

T/T^h	Tap	pi:T
	sound of dripping (water)	beat
	T^hAp	pi:T^h
	inert	back
T^h/D^h	T^hAk	
	sound of knocking	
	D^hAk	
	cover	
T/D	TA^nn	ka:T
	sound of ringing (as of bell etc.)	cut
	DA^nn	ka:D
	arm	card
D/D^h	Da:l	
	branch of a tree	
	D^ha:l	
	shield	

c c^h j j^h

c/c^h	ca:l	ka:c
	motion	glass
	c^ha:l	ka:c^h
	skin	upper part of the thigh
c^h/j^h	c^hi:l	
	peel, husk	
	j^hi:l	
	lake, pool	
c/j	cAl	bi:c
	move	center
	jAl	bi:j
	be burnt	seed
j/j^h	jAl	su:j
	be burnt	swell
	j^hAl	su:j^h
	move to and fro (a fan, etc.)	be seen

k k^h g g^h

k/k^h	ka:T	sIk
	cut	be roasted
	k^ha:T	sIk^h
	cot	Sikh

k^h/g^h	$k^ha:^ns$		
	cough		
	$g^ha:^ns$		
	grass		
k/g	kAl	nIka:	$b^hi:k$
	parts	marriage	alms
	gAl	nIga:	$b^hi:g$
	be boiled	glance, view	be wet
g/g^h	go:l		
	round		
	$g^ho:l$		
	solvent		

(ii) Contrast of Stops in Terms of Articulators:

p t T c k

p/t	pAl		pa:p
	eyelid		sin
	tAl		pa:t
	fry		leaf
t/T	$tA^n n$	$bAtA^n n$	po:t
	stretch	womb	white-wash
	$TA^n n$	$bATA^n n$	po:T
	sound of ringing (as of bell etc.)	button	persuade through flattery

T/c	Ta:T	lATAk	pAT
	mat	be suspended	be carried on satisfactorily
	ca:T	lAcAk	pAc
	lick	flexibility	be digested
c/k	cAl	mAka:^{n}n	pAc
	move	house	be digested
	kAl	mAca:^{n}n	pAk
	side, flank	raised platform	be cooked

p^h t^h T^h c^h k^h

p^h/t^h	p^hu:k	
	blow	
	t^hu:k	
	spittle, saliva	
t^h/T^h	t^h A^{n}n	sa:t^h
	udder	company
	T^hA^{n}n	sa:T^h
	be fixed	sixty
T^h/c^h	T^hA^{n}n	
	be fixed	
	c^hA^{n}n	
	be filtered	

c^h/k^h	$c^ha:^n n$	
	filter	
	$k^ha:^n n$	
	cave, mine	

b^h d^h D^h j^h g^h

b/d^h	$b^hu:l$	
	forgetfulness	
	$d^hu:l$	
	dust	
d^h/D^h	d^hUl	
	be washed	
	D^hUl	
	be carried	
D^h/j^h	$D^ha:^n k$	
	cover, conceal	
	$j^ha:^n k$	
	peep	
j^h/g^h	$j^ha:l$	
	pungency (as of chillies)	
	$g^ha:l$	
	trap, entangle	

(iii) Nasals Contrasted in Terms of Articulators:

m n ŋ

m/n	ma:l	$ka:^n m$
	wealth	work

	na:l		ka:ⁿn
	barrel		ear
n/ŋ			ja:ⁿn
			know
			ja:ⁿŋ
			thigh
m/ŋ			ja:ⁿm
			guava
			ja:ⁿŋ
			thigh

(iv) Contrast of Fricatives in Terms of Articulators:

f s ʃ x

f/s	fAⁿn	nAfrAt	xa:f
	skill	disgust, hate	twenty-seventh letter of the Urdu alph-abet
	sAⁿn	nUsrAt	xa:s
	jute	victory	special
s/ʃ	sa:d	bAsAr	na:s
	twentieth letter of the Urdu alphabet	spend, live	loss, destruction
	ʃa:d	bAʃAr	na:ʃ

	glad, delighted	human being	dead body
ʃ/x	ʃa:^{n}m	bUʃra:	ta:ʃ
	evening	appearance	playing card
	xa:^{n}m	bUrxa:	ta:x
	raw, unripe	veil	niche

v z ɣ h

v/z	vo:		pa:v
	he, she, it		quarter
	zo:		
	twenty-third letter of the Urdu alphabet		
z/ɣ	zA^{n}m	ba:zi:	ba:z
	conjunction	game, bet	hawk
	ɣA^{n}m	ba:ɣi:	ba:ɣ
	sorrow	rebellion	garden
ɣ/h	ɣa:r		
	cave		
	ha:r		
	defeat		

(v) Contrast of Fricatives in Terms of Voicing:

f v s z ʃ x ɣ h

f/v	fe	dAfa:	sa:f
	twenty-sixth letter of the Urdu alphabet	section	clean

	vo:	dAva:	pa:v
	he, she, it	medicine	quarter
s/z	sa:t	fAsAl	sa:s
	seven	crop	mother-in-law
	za:t	fAzAl	sa:z
	caste	bounty	music
x/ɣ	xo:l	AxAl	to:x
	case	wisdom	neck-ring
	ɣo:l	bAɣAl	te:ɣ
	crowd	side	sword
f/h	fa:l	a:hAT	
	omen, augury	sound of footsteps	
	ha:l	a:fAt	
	condition	misfortune	

(vi) Contrast of Liquids in Terms of Articulators:

w l r R y

w/l	wa:		
	well done !		
	la:		
	bring		
l/r	lAs	hi:la:	ca:l
	viscosity	deception	motion
	rAs	hi:ra:	ca:r
	juice	diamond	four

r/R	re:	sArAk	ka:r
	fourteenth letter of the Urdu alphabet	give way	car
	Re:	sARAk	ka:R
	fifteenth letter of the Urdu alphabet	road	embroider
r/y	rAk	sa:ra:	
	keep	whole	
	yAk	sa:ya:	
	one	shadow	
l/y	la:d	sa:la:	
	load	brother-in-law	
	ya:d	sa:ya:	
	remeberance	shadow	

(vii) Retroflex Stop and Retroflex Flap Contrasted:

D R

D/R	De:R	mU^{n}NDna:	ka:D
	one and a half	be shaved	card
	Re:	mURna:	ka:R
	fifteenth letter of the Urdu alphabet	be turned	embroider

Section A2(b): Vocalic Contrasts

Vocalic contrasts of Deccani Urdu are presented below.

(i) Contrast of Short Vowels *versus* Long Vowels:

Contrast	Pairs	Gloss
I/i:	bIc	be stretched
	bi:c	center
I^{n}/i:^{n}	bI^{n}n	without
	bi:^{n}n	Indian flute
A/a:	hAl	plough
	ha:l	condition
A^{n}/a:^{n}	mA^{n}n	heart, mind
	ma:^{n}n	den (of a wild beast)
U/u:	pUj	be worshiped
	pu:j	worship
U^{n}/u:^{n}	bU^{n}n	weave
	bu:^{n}n	drop
I/e:	bIl	hole
	be:l	creeping plant
I^{n}/e:^{n}	sI^{n}n	age
	se:^{n}n	white spot
U/o:	pUr	full, laden
	po:r	knuckle
U^{n}/o:^{n}	nU^{n}c	be scratched
	no:^{n}c	scratch
I/ɛ:	sIr	head
	sɛ:r	morning walk

$I^n/\varepsilon:^n$	bIn	without
	$b\varepsilon:^n n$	sister
U/ɔ:	tUl	be weighed
	tɔ:l	weigh
$U^n/ɔ:^n$	$sU^n n$	numb
	$sɔ:^n p$	entrust

(ii) Contrast of Oral *versus* Nasal Vowels:

$i:/i:^n$	$t^h i:$	was (fem. sg.)
	$t^h i:^n$	were (fem. pl.)
I/I^n	sIga:r	cigar
	$sI^n ga:r$	make-up
$e:/e:^n$	re:l	rail
	$re:^n ŋ$	creep
A/A^n	dAs	ten
	$d^h A^n s$	sink
$\varepsilon:/\varepsilon:^n$	$b^h \varepsilon:s$	argument
	$b^h \varepsilon:^n s$	cow buffalo
$a:/a:^n$	ba:s	odor
	$ba:^n s$	bamboo
$u:/u:^n$	pu:c	ask
	$pu:^n c$	tail
U/U^n	bUt	idol
	$bU^n n$	weave, knit

o:/o:ⁿ	bo:	sow
	bo:ⁿ	price
ɔ:/ɔ:ⁿ	kʰɔ:l	boil
	kɔ:ⁿla:	tender

(iii) Contrast of Front Unrounded *versus* Back Rounded Vowels:

i:/u:	pi:t	juice of a betel leaf chewed and spit out
	pu:t	son
I/U	pIT	be beaten
	pUT	upper arm
iⁿ/uⁿ	biⁿn	Indian flute
	buⁿd	drop
Iⁿ/Uⁿ	bIⁿn	without
	bUⁿn	weave, knit
e:/o:	be:l	wood-apple
	bo:l	speech, utterance
eⁿ/oⁿ	geⁿd	ball
	goⁿd	gum
ɛ:/ɔ:	sɛ:	bear, tolerate
	sɔ:	hundred
ɛⁿ/ɔⁿ	pɛⁿn	wear
	pɔⁿn	three quarters

(iv) Contrast of Central A(Schwa) *versus* I and U, and A^n *versus* I^n and U^n:

A/I	pAs	be skimmed
	pIs	be crushed
A/U	pAI	eyelid, moment
	pUI	bridge
A^n/I^n	pA^nn	but
	pI^nn	pin
A^n/U^n	bA^nn	forest
	bU^nn	weave, knit

(v) Contrast of Central a:*versus* ɛ: and ɔ:, and a: *versus* $ɛ:^n$ and $ɔ:^n$:

a:/ɛ:	ba:g	reign, briddle
	bɛ:g	bag
a:/ɔ:	ba:l	hair
	bɔ:l	ball
$a:^n/ɛ:^n$	$ba:^nn$	embankment, dam
	$bɛ:^nn$	sister
$a:^n/ɔ:^n$	$pa:^nc$	five
	$pɔ:^nc$	reach, arrive

Section B: Role of Communication in Combinatory Phonology

In the previous section, we have dealt with the paradigmatic relations of phonological units in terms of communication. In the present section, we analyze the role of communication in the syntagmatic distribution of the phonological units in Deccani Urdu.

Section B1: Pair of Words with the Same Phonological Units in Reverse Order

Among monosyllabic, the CVC words begin and end with a consonant except for a few words where the initial or the final consonants may become zero. Further, the consonant in the CVC words represents any of the forty consonantal units of Deccani Urdu (Cf. Diagram I-1).

It is significant to note that in Deccani Urdu, there are many instances where an interchange of initial and final consonants causes drastic change in meaning. This syntagmatic interchange of consonantal units such as C_1VC_2 and C_2VC_1 may represent two well-defined words with entirely different meanings. This syntagmatic interchange of consonants can be presented by the following pairs of monosyllabic words.

Consonants Interchanged	Pair of Words	Gloss[6]
Ø/p	a:p	you (polite)
	pa:	find out
Ø/t	a:t	infinite
	ta:	to
Ø/j	a:j	today
	ja:	go
Ø/g	a:g	fire
	ga:	sing
Ø/s	a:s	hope
	sa:	like
Ø/l	a:l	off-spring
	la:	bring
Ø/r	a:r	disgrace modesty
	ra:	road
Ø/b	u:b	be fed up
	bu:	odor
Ø/k	e:k	one
	ke:	of
Ø/T	o:T	vote
	To:	feel
Ø/s	o:s	dew

[5] For form classes and further details of meaning see glossary of the monosyllabic words.

	so:	sleep
∅/r	o:r	side
	ro:	weep
∅/b	ɛ:b	defect
	bɛ:	float
∅/ʃ	ɛ:ʃ	pleasure
	ʃɛ:	thing
∅/l	ɛ:l	able
	lɛ:	singing in tune
p/T	pAT	thigh
	Tap	sound of dripping (water)
p/k	pAK	be cooked
	kAp	cup
p/l	pll	rush against
	lip	be plastered
p/c	pUc	we wiped
	cUp	silence
p/c^h	pUc^h	be wiped
	c^hUp	he hidden
p/t	pa:t	leaf
	ta:p	heat
P/T	pa:T	slab
	Ta:p	hoof (of a horse)

p/c	pa:c	emerald
	ca:p	sound of footsteps
p/T	pi:T	beat
	Ti:p	compress
p/c	pi:c	starch
	ci:p	press
p/s	pi:s	crush
	si:p	oyester-shell
p/s	pu:s	ninth month of the Hindu calendar
	su:p	flat basket (for winnowing)
p/T	pe:T	stomach
	Te:p	tape recorder
p/l	pe:l	crush
	le:p	soft plaster
p/t	po:t	white-wash
	to:p	cannon
P/T	po:T	persuade through flattery
	To:p	hat
p/k	pɛ:k	pack
	kɛ:p	cap
b/d	bAd	bad
	dAb	less
b/T	bAT	tripe

	Tab	tub
b/j	bAj	be rung
	jAb	when (relative)
b/k	bAk	prattle
	kAb	when
b/s	bAs	power
	sAb	all
b/l	bAl	twist
	lAb	lip
b/r	bAr	fruit
	rAb	God
b/t	ba:t	talk
	ta:b	strength
b/d	ba:d	wind
	da:b	press down
b/g	ba:g	reign
	ga:b	pregnant (animal)
b/j	bi:j	seed
	ji:b	tongue
b/r	bo:r	boring
	ro:b	aweinspiring
t/l	tAl	fry
	lAt	creeper
t/r	tAr	wet

	rAt	chariot
t/k	ta:k	look at
	ka:t	spin (thread)
t/l	ta:l	clapping
	la:t	leg
t/r	ta:r	wire
	ra:t	night
t/j	ti:j	third day of a lunar fortnight
	ji:t	win
t/r	ti:r	arrow
	ri:t	custom
d/l	dAl	grind coarsely
	lAd	be loaded
d/k	dUk^{h}	pain
	k^{h}Ud	be dug
d/s	da:s	slave
	sa:d	twentieth letter of the Urdu alphabet
d/l	da:l	split pulse
	la:d	load
T/k	Tak	be stitched
	kAT	be cut
T/l	TAl	pass over
	lAT	lock of hair

T/r	TAr	croak
	rAT	memorize
T/l	Ta:l	put off
	la:T	lord
T/r	Tu:r	tour
	ru:T	be vexed
T/k	To:k	question
	ko:T	court
D/k	Da:k	mail
	ka:D	card
D/l	Da:l	branch of a tree
	la:D	love
D/l	Do:l	move to and fro
	lo:D	load
D/r	Do:r	thread
	ro:D	road
c/k	cAk	taste
	kAc	the water in which raw rice has been washed
c/r	cAr	graze
	rAc	be stained
c/k	ca:k	slit
	ka:c	the upper part of the thigh
c/r	ci:r	cut open

	ri:c	crocodile
c/k	cu:k	mistake
	ku:c	departure
j/l	ja:l	net
	la:j	shyness
j/s	ju:s	juice
	su:j	swell
k/s	kAs	tighten
	sAk	be able
k/ʃ	kAʃ	puff
	ʃAk	doubt
k/r	kAr	do
	rAk	keep
k/s	kIs	who
	sIk	be warmed
k/l	ka:l	inauspicious time
	la:k	lakh
k/r	ka:r	work
	ra:k	ashes
k/l	ki:l	key
	li:k	eggs of louse
k/s	ke:s	hair
	se:k	warm
k/s	ko:s	curse

	so:k	soak
k/r	ko:r	edge
	ro:k	ban
k/n	ka:^{n}n	ear
	na:^{n}k	nose
g/l	gAl	be boiled
	lAg	be attached
g/r	gAr	be squeezed
	rAg	artery
g/l	ga:l	cheek
	la:g	correlation
g/r	ga:r	squeeze
	ra:g	jaggery, raw sugar
g/l	go:l	round
	lo:g	people
g/r	go:r	grave
	ro:g	disease
m/n	mA^{n}n	heart
	nA^{n}m	moist
m/n	ma:^{n}n	den (of a wild beast)
	na:^{n}m	name
n/s	nA^{n}s	vein
	sA^{n}n	jute
s/r	sAr	head

	rAs	juice
s/r	sIr	head
	rIs	leak
s/r	su:r	trumpet blown on the day of resurrection
	ru:s	Russia
s/r	se:r	seer: measure of weight
	re:s	race
z/r	zo:r	power
	ro:z	day

The above listed words of Deccani Urdu are very good examples of communicative economy achieved through combinatory phonology. It may be noted that we get two words having different meanings by employing the same number of phonological units in the reverse order. However, the above presented word list include only selected monosyllabic words, a fuller utilization of phonological units in different order with change in meaning, can be seen in the organization of polysyllabic words in Deccani Urdu. It is to be pointed out that the concept of communicative economy through combinatory phonology is fully developed in terms of "double articulation" of language by Andre Martinet (1964: 22-24).

Section B2: Communication and the CVC, the CVCC, and the CCVC Words

Unlike the CVC words, the words with consonant clusters require greater precision of control in their production, simply because there are more phonological units to be coordinated with. We therefore expect that the CVC words should be preferred over both the CVCC words and the CCVC words. The actual occurrences of the three types of monosyllabic words are presented in Table III-1 below.

Monosyllabic words	CVC	CVCC	CCVC	TOTAL
Number	1545	183	7	1735
Percentage	89.05	10.55	.40	100

Table III-1: Frequency of the CVC, the CVCC, and the CCVC Words in Deccani Urdu

Comments on Table III-1

As seen in the table above, of the 1735 monosyllabic words in Deccani Urdu, 1545 are CVC, 183 CVCC and 7 CCVC type. That is, there is a vast skewing in favor of the CVC words and against the CVCC and CCVC words. Although this skewing is mainly motivated by the human trait of avoiding greater precision of control, the interaction of communication further reinforces this tilt. For the communicative load of the phonological units progressively decreases as we move from

the beginning to the end in the syntagmatic organization of the word in a languge or dialect. Further, it is noteworthy that fewer units are preferred over greater number of units in the formation of morphemes and words. Thus, consonant clusters, produced with greater number of units, which have more phonological distinctions, are disfavored in terms of both communication and human behavior orientations

Section B3: Communicative Load and the Position of the Phonological Units in the word

Communication plays an important role in the combinatory phonology of a language. It is a common experience that the beginning of the word carries a greater communimcative load than does the end of the word. Moreover, the communicative load decreases by degrees as we move from initial to the final position of the word. We, therefore, expect that the maximum utilization of phonological units should occur in the word initial position, whereas these units could be selectively under-utilized at the final position of the word.

With a view to evaluating the role of communication, we now examine the occurrences of various categories of consonants in the initial and final positions of the word. Our presentation here is limited to the CVC words of Deccani Urdu.

Section B3(a): Communicative Load and the Hierarchy of the Adroitness of Articulators

In the chapter on physiological mechanism, we assessed the effect of hierarchy of adroitness of articulators on both the paradigmatic make-up and syntagmatic distribution of phonological units of Deccani Urdu. (Cf. Chapter I, section B.)

We found that the apicals produced by physiologically most adroit apex were most favored, followed by the labials and dorsals, produced by more adroit labium and dorsum, and the medials produced by least adroit medium.

Here we assess the effect of communicative load on the distribution of consonantal units in the initial and final positions of the CVC words in terms of hierarchy of adrotiness of articulators. As stated earlier, the initial position of the word is characterized with more communicative load than the final position. Therefore, communication suggests that there should be a competitive use of phonological units in the word initial position. On the contrary, a selective use of these units is expected in the word final position.

In the following subsections, we examine the communicative impact on the relative preference of the consonantal units in the initial and final position of the words in terms of hierarchy of adroiteness of articulators.

Section B3(a)(i): Impact of Communication on the Relative Preference of the Consonantal Units in Terms of Articulators in the CVC Words

As discussed earlier (cf.Chapter I, section B), the syntagmatic distribution of the phonological units are also affected by the hierarchy of the adroitness of articulators. Therefore, the apical, the labial-dorsal and the medial consonantal units are arranged in this order according to their preference in terms of the hierarchy of adroitness of articulators. Now here we analyze the distribution of consonantal units from the viewpoint of communication in the initial and the final position of the CVC words in terms of articulators through Table III-2.

Consonants	Initial %	Initial No	Initial %	Final %	Final No	Final %	Total %	Total No	Total %
Apico-Dental	32.01	460	42.59	44.32	620	57.41	38.08	1080	100
Apico-Palatal	6.75	97	28.96	17.01	238	71.04	11.81	335	100
Apical	38.76	557	39.36	61.33	858	60.64	49.89	1415	100
Labial	27.56	396	67.92	13.37	187	32.08	20.56	583	100
Dorsal	18.09	260	54.62	15.44	216	45.38	16.78	476	100
Medial	15.59	224	61.88	9.86	138	38.12	12.77	362	100
Total	100	1437	50.67	100	1399	49.33	100	2836	100

Table III-2: Frequency of the Consonantal Units in the Initial and Final Positions in the CVC Words in Terms of Articulators

Comments on Table III-2

Comment 1: As seen in the last column in the table above, of the 2836 consonantal occurrences appearing in the CVC words, 1415 are apicals, 583 labials, 476 dorsals, and 362 medials. As these figures show, the number of occurrences

decline as we move down from the most adroit apex to the less adroit medium. That is, the frequency of occurrence for the apical, labial, dorsal, and medial consonants fully conforms to our predictions in terms of the hierarchy of adroitness of supraglottal articulators. (For details cf. Chapter I, section B.)

Comment 2: As seen in this table, of the 1437 occurrences of consonants in the initial position of the CVC words, there are 557 apicals, 396 labials, 260 dorsals, and 224 medials. In this communicatively important initial position of the word, it is noteworthy that all the four types of consonants are competitively utilized, which is in conformity with our expectation in terms of communication. It may however be noted that whereas both communication and hierarchy of adroitness, dictate that the labials (396) and the dorsals (260) should be equally utilized in the initial position of the word, the former outnumber the latter. The rationale for this skewing may well be provided by vision, for the visually observable labial units are always preferred in the word initial position. (For details cf. Chapter IV.)

Comment 3: As shown in Table III-2, of the 1399 occurrences of consonants in the final position of the CVC words, there are 858 apicals, 187 labials, 216 dorsals, and 138 medials. In this communicatively least important position of the word, it is noteworthy that there is a strong impact of the hierarchy of

adroitness of articulators in the distribution of apical, labial, dorsal, and medial consonants. As seen in the figures, the apicals alone here appear in over three-fifth of all the consonantal types combined. It may however be noted that rather than being competitively utilized, the labials (187) are outnumbered by the dorsals (216). This disfavoring for the labial consonants may well have been brought about jointly by two factors, the minimum communicative load and the inverse impact of the visibility of the labia, at the end of the word.

Section B3(a)(ii): Impact of Communication on the Relative Preference of the Stops in Terms of Articulators in the CVC Words.

In this section, we make a comparison of the frequencies for the apical, the labial, the dorsal, and the medial stops in the initial and final positions with a view to evaluating the impact of communication. We present in Table III-3, the actual occurrences of the opposing stops in the initial and final positions in the CVC words in Deccani Urdu.

Stops	Initial % No %	Final % No %	Total % No %
Apico-Dental	17.47 171 56.81	19.46 130 43.19	18.27 301 100
Apico-Palatal	9.80 96 38.71	22.76 152 61.29	15.06 248 100
Apical	27.27 267 48.63	42.22 282 51.37	33.33 549 100
Labial	31.05 304 73.97	16.02 107 26.03	24.95 411 100
Dorsal	22.17 217 57.11	24.40 163 42.89	23.80 380 100
Medial	19.51 191 62.21	17.36 116 37.79	18.64 307 100
Total	100 979 59.44	100 668 40.56	100 1647 100

Table III-3: Frequency of the Stops in the Initial and Final Positions in the CVC Words in Terms of Articulators

Comments on Table III-3

Comment 1: As seen in the last column in the table above, of the 1647 occurrences of stops in the CVC words, 549 are apicals, 411 labials, 380 dorsals, and 307 medials. That is,

the frequency of occurrence for all the four types of stops are in conformity with our expectations in terms of the scale relationship.

Comment 2: As shown in this table, of the 979 occurrences of stops in the initial position of the CVC words, there are 267 apicals, 304 labials, 217 dorsals, and 191 medials. As these figures indicate, there is a competitive use of all the four types of stops in this communicatively important position of the word. That is, this competitive use in the initial position of the word is clearly motivated by our orienting principle of communication. Further, it is noteworthy that the extraordinary skewing in favor of the labial stops is brought about by the interaction of vision with communication. (Cf. Table IV-1, comment 1.)

Comment 3: As shown in Table III-3, of the 668 occurrences of stops in the final position of the CVC words, there are 282 apicals, 107 labials, 163 dorsals, and 116 medials. In this communicatively least important position of the word, it is noteworthy that there is a strong impact of the hierarchy of adroitness of articulators in the distribution of the stop types. As seen in the figures, the favored apical stops with 282 occurrences are additionally favored and the disfavored medial stops with 116 occurrences are additionally disfavored in this position of the word. Further, it may be noted that the extraordinary skewing against the labial stops in the final

position of the word is brought forth jointly by two factors, the minimum communicative load and the inverse impact of the visibility of the labia.

Section B3(a)(iii): Impact of Communication on the Relative Preference of the Nasals in Terms of Articulators in the CVC Words

In this section, we assess the impact of communication on the distribution of nasal consonants in the initial and final positions of the CVC words in Deccani Urdu. The actual frequencies of the opposing phonological units, as they appear in the CVC words, are presented in Table III-4.

Nasals	Initial % No %	Final % No %	Total % No %
Apico-Dental	46.87 60 35.93	55.16 107 64.07	51.86 167 100
Apico-Palatal	0 0 0	0 0 0	0 0 0
Apical	46.87 60 35.93	55.16 107 64.07	51.86 167 100
Labial	53.13 68 54.84	28.87 56 45.16	38.51 124 100
Dorsal	0 0 0	15.97 31 100	9.63 31 100
Medial	0 0 0	0 0 0	0 0 0
Total	100 128 39.75	100 194 60.25	100 322 100

Table III-4: Frequency of the Nasals in the Initial and Final Positions in the CVC Words in Terms of Articulators

Comments on Table III-4

Comment 1: As seen in the last column in the table above, of the 322 occcurrences of the nasal consonants in the CVC words, 167 are apical, 124 labial, 31 dorsal, and 0 medial. As seen in these figures the scale relationship is more or less maintained. (For details cf. Table I-4, comment 2.)

Comment 2 As shown in the table, of the 128 occurrences of the nasals in the initial position of the CVC words, the apical nasal (apico-dental n) has 60 occurrences, labial nasal (m) 68 occurrences, dorsal nasal (ŋ) 0 occurrence, and the medial nasal (ñ) 0 occurrence. As these figures indicate, the apical nasal and the labial nasal are competitively utilized in this communicatively important position of the word. Further, there is a skewing in favor of the labial nasal and against the apical nasal in this position of the word. The rationale for this skewing will be provided in Chapter IV, when we deal with vision as an orienting principle.

It may however be pointed out here that the 0 occurrence for the dorsal nasal and the medial nasal is against our expectations in terms of communication and hierarchy of adroitness of articulators. The rationale for this

skewing may well be attributed to the fact that both the nasal consonants do not occur in the initial position of the word in Deccani Urdu. For the dorsal nasal (ŋ) is a marginal phoneme which appears in the word final position, and also before a dorsal consonant, whereas the medial nasal (ñ) is a positional variant that occurs only before the medial consonants in a limited number of words.

Comment 3: As seen in Table III-4, of the 194 occurrences of the nasal consonants in the final position of the CVC words, there are 107 apical nasal, 56 labial nasal, 31 dorsal nasal, and 0 medial nasal. As these figures clearly indicate, there is an impact of the hierarchy of adroitness in the distribution of the apical, labial, dorsal, and medial nasals in this communicatively least important final position of the word. The apical nasal appear in a ratio of almost 2 to 1 the labial nasal and over 3 to 1 the dorsal nasal in this position of the word. Further, it may be noted that rather than going down further in their frequency of usage, the labial m appears in a ratio of over 1¼ to 1 the dorsal ŋ (31) in word final position. But the problem lies with the dorsal nasal and not with the labial nasal. As we have noted in comment 1 above, the dorsal ŋ is a marginal phoneme in Deccani Urdu. Further, the medial ñ has 0 occurrence in the final position of the word also because it does not occur in the CVC words at all.

Section B3(a)(iv): Impact of Communication on the Relative Preference of the Liquids in Terms of Articulators in the CVC Words

In this section, we gauge the impact of communication on the distribution of "liquids" in the initial and final positions of the CVC words in Deccani Urdu. The actual occurrences of the opposing "liquid" types, as they appear in the CVC words, are presented in Table III-5.

Liquids	Initial % No %	Final % No %	Total % No %
Apico-Dental	86.92 113 28.75	76.09 280 71.25	78.92 393 100
Apico-Palatal	.77 1 1.15	23.37 86 98.85	17.47 87 100
Apical	87.69 114 23.75	99.46 366 76.25	96.39 480 100
Labial	2.31 3 75.00	.27 1 25.00	.80 4 100
Dorsal	2.31 3 75.00	.27 1 25.00	.80 4 100
Medial	7.69 10 100	0 0 0	2.01 10 100
Total	100 130 26.1	100 368 73.9	100 498 100

Table III-5: Frequency of the Liquids in the Initial and Final Positions in the CVC Words in Terms of Articulators

Comments on Table III-5

Comment 1: As seen in the last column in the table above, of the 498 occurrences of the "liquids" in the CVC words, 480 are apical, 4 labial, 4 dorsal, and 10 medial. As these figures show, the apical "liquids" (498) appear in a ratio of over 25 to 1 the labial, dorsal, and medial "liquids" combined (18). That is, there is a drastic skewing, approaching an almost total skewing in favor of the occurrences produced by the most adroit apex. Of course, it is the extraordinary adroitness of the apex that brings about this drastic skewing in favor of the apical "liquids". (For details cf. Table I-5, comment 1.)

Comment 2: As shown in the table, of the 130 occurrences of the "liquids" in the initial position of the CVC words, there are 114 apical, 3 labial, 3 dorsal, and 10 medial. As these figures indicate, the drastic skewing in favor of the apical "liquids" is brought about by the extraordinary adroitness of the apex. It may be noted that notwithstanding the greater communicative load in word initial position, we encounter a drastic skewing in favor of the apical "liquids". For, in case of "liquids" in the communicatively and visually important initial position of the word, the effect of communication and vision are often sidelined by the powerful impact of the extraordinary adroitness of apex.

Further, it is noteworthy that the low frequencies for the labial and dorsal w (produced by the more adroit labium and

dorsum) *vis-a-vis* the medial y (produced by the least adroit medium), is against our expectations. For the semivowel w is produced simultaneously by two articulators--the labium and the dorsum. Thus, the low frequency of occurrence of w may well be attributed to the human trait to sparingly utilize the more complex units in terms of number of articulators. Whereas, unlike the labio-dorsal w, the medial semivowel y is produced by only one articulaor, namely, the medium. Therefore, in terms of number of articulators, y may be preferred over w.

Comment 3: As seen in Table III-5, of the 368 occurrences of the "liquids" in the final position of the CVC words, there are 366 apical, 1 labial, 1 dorsal, and 0 medial. As seen in the figures, the favored apical "liquids" are additionally favored whereas the disfavored labial, dorsal, and medial "liquids" are additionally disfavored in terms of human behavior, in this communicatively and visually least important final position of the word. This drastic skewing, approaching an almost total skewing in favor of the apical "liquids" is again in conformity with our expectations.

Section B3(b): Impact of Communicative Load on the Initial and Final Positions of the Word in Terms of Number of Articulators

In terms of human behavior orientation, we expect that the phonological units involving fewer articulators are

preferred over those utilizing more articulators. (Cf. Chapter II, section A.)

However, it is noteworthy that from communicative viewpoint, we expect a rather competitive utilization of all the phonological units in the communicatively important word initial position, and a selective under-utilization of these units in the communicatively least important word final position.

In this section, we make an attempt to examine the effect of communication on the frequency of occurrence of the consonantal units utilizing both fewer and more articulators in the initial and final positions of the CVC words in Deccani Urdu. Here we will be dealing with the frequency of the voiceless and the voiced among the unaspirated stops, the unaspirated and the aspirated among the voiceless stops, and the voiceless and the voiced fricatives, in the initial and the final position of the CVC words in Deccani Urdu through Table III-6, Table III-7, and Table III-8, respectively. It may however be noted that here we are not dealing with the voiced aspirated stops. The voiced aspirated stops are extraordinarily complex for they are produced with a difficult glottal articulation, and not by adding aspiration to the voiced unaspirated stops. For the rationale for the acoustic complexity see Chapter V, section D.

Stops (Unasp-irated)	Initial %	No	%	Final %	No	%	Total %	No	%
Voiceless	50.89	344	44.39	69.29	431	55.61	59.71	775	100
Voiced	49.11	332	63.48	30.71	191	36.52	40.29	523	100
Total	100	676	52.08	100	622	47.92	100	1298	100

Table III-6: Frequency of the Voiceless and the Voiced among the Unaspirated Stops in the Initial and Final Positions in the CVC Words

Comments on Table III-6

Comment 1: As seen in the last column in the table above, of the 1298 occurrences of unaspirated stops in the CVC words, 775 occurrences are voiceless and 523 are voiced. This vast skewing in favor of the voiceless stops and against the voiced stops is fully justified in view of the human behavior orientation. (cf. Table II-2, comment 2.)

Comment 2: As shown in this table, of the 676 occurrences of unaspirated stops in the initial position of the CVC words, there are 344 voiceless and 332 voiced. In this communicatively important initial position of the word, it is noteworthy that both the voiceless and voiced unaspirated stops are competitively utilized. This is clearly in conformity

with our expectation in terms of communication. It may however be noted that the human trait of preferring simpler phonological units over more complex units, is fully neutralized by the powerful impact of communication in the word initial position.

Comment 3: As seen in Table III-6, of the 622 occurrences of the unaspirated stops in the final position of the CVC words, 431 are voiceless and 191 are voiced. That is, the voiceless unaspirated stops appear in a ratio of almost 2 to 1 the voiced unaspirated stops in this communicatively least important final position of the word. It is noteworthy that this vast skewing in favor of the voiceless unaspirated stops and against the voiced unaspirated stops, is brought about by the joint interaction of the human preference for fewer articulators over more articularos, and the lesser communicative load in the final position of the word.

Stops (Voice-less)	Initial			Final			Total		
	%	No	%	%	No	%	%	No	%
Unaspir-ated	67.58	344	44.39	91.70	431	55.61	79.16	775	100
Aspirated	32.42	165	80.88	8.30	39	19.12	20.84	204	100
Total	100	509	51.99	100	470	48.01	100	979	100

Table III-7: Frequency of the Unaspirated and the

Aspirated among the Voiceless Stops in the Initial and Final positions in the CVC Words

Comments on Table III-7

Comment 1: As seen in the last column in the table above, of the 979 occurrences of the voiceless stops in the CVC words, 775 occurrences are unaspirated and only 204 occurrences are aspirated. That is, the voiceless unaspirated stops appear in a ratio of almost 4 to 1 the voiceless aspirated stops. This vast skewing in favor of the unaspirated stops and aginst the aspirated stops is brought forth by the human preference for fewer articulators over more articulators.

Comment 2: As shown in this table, of the 509 occurrences of the voiceless stops in the initial position of the CVC words, 344 occurrences are unaspirated and 165 occurrences are aspirated. Here again we see that both unaspirated and aspirated stops are more or less competitively utilized in the communicatively important word initial position.

Comment 3: As seen in Table III-7, of the 470 occurrences of the voiceless stops in the final position of the CVC words, 431 are unaspirated and only 39 are aspirated. That is, the voiceless unaspirated stops appear in a ratio of over 11 to 1 the voiceless aspirated stops in this communicatively least important word final position. It is noteworthy that this vast skewing in favor of the voiceless unaspirated stops and against the voiceless aspirated stops is brought forth by the

well-known human trait of preferring fewer articulators over more articulators and the lesser communicative load in the word final position.

Fricat-ives	Initial %	No	%	Final %	No	%	Total %	No	%
Voiceless	70.42	169	54.69	82.84	140	45.31	75.55	309	100
Voiced	29.58	71	71	17.16	29	29	24.45	100	100
Total	100	240	58.68	100	!69	41.32	100	409	100

Table III-8: Frequency of Voiceless and Voiced Fricatives in the Initial and Final Positions in the CVC Words

Comments on Table III-8

Comment 1: As seen in the table above, of the 409 occurrences of fricatives in the CVC words, 309 occurrences are voiceless and 100 occurrences are voiced. That is, the voiceless fricatives appear in a ratio of 3 to 1 the voiced fricatives. The rationale for this vast skewing in favor of the voiceless fricatives and against the voiced fricatives may well be attributed to the human trait of preferring fewer articulators over more articulators.

Comment 2: As shown in this table, of the 240 occurrences of the fricatives in the initial position of the CVC words, 169 instances are voiceless and 71 instances are voiced. Here

again we find that both voiceless and voiced fricatives are more or less competitively utilized in this communicatively important position of the word.

Comment 3: As seen in Table III-8, of the 169 occurrences of the fricatives in the final position of the CVC words, 140 instances are voiceless and only 29 instances are voiced. That is, the voiceless fricatives appear in a ratio of over 4½ to 1 the voiced fricatives, in this communicatively least important word final position. The rationale for this vast skewing in favor of the voiceless fricatives and against the voiced fricatives may well be attributed to the joint interaction of lesser communicative load in the final position of the word, and human trait of preferring fewer articulators over more articulators.

Section C: Phonological Merger

As mentioned earlier that the phonological units are not randomly arranged in a language or dialect. The phonological units may be used in a large number of words, whereas some of the phonological units may be utilized more rarely in only a limited number of words. That is, phonological units appearing in a large number of words are characterized with a higher communicative load as compared to those units which appear in a fewer number of words. Therefore, we expect that the phonological units having higher communicative load are likely to survive in a language or dialect. However, the rarely

used phonological units with low communicative load may be eliminated or merged with the neighboring units.

The paradigm of phonological units of Deccani Urdu is characterized by the consonantal mergers only. The classical Urdu and modern standard Urdu consonantal units: q m^h n^h and l^h have completely merged with: x m n and l respectively, in Deccani Urdu.

In terms of communication the phonological units q m^h n^h and l^h have lesser communicative load *vis-a-vis* x m n and l. For these units (q m^h n^h and l^h) occur in a limited number of words in classical and modern standard Urdu.

Physiologically the post dorsum is the least adroit among all the supraglottal articulators. Further, q is the only post dorsal unit produced at this axis (as opposed to four members on other axes at ∅ aperture). Thus there is a lot of pressure on this unit either to be eliminated or merged with some other phonological unit, so that an extra axis is removed. Therefore, the merger of this voiceless stop (q) to the nearest voiceless fricative (x) is fully justified.

Here we present a list of classical and modern standard Urdu words which have merged in Deccani Urdu. It may parenthetically be pointed out that we have listed only those words where phonological merger has taken place either initially or both initially and finally. And we have left all those

words which show merger only at the final position of the word. For such types of words are very few in Deccani Urdu.

Merged Unuit	Modern Standard Urdu Words	Deccani Urdu Words	Gloss[6]
q	qAbz	xAbz	constipation
	qAd	xAd	height
	qAlb	xAlb	heart
	qIst	xIst	instalment
	qIsm	xIsm	division; kind
	qUl	xUl	first word of some suras of the holy Qur'an
	qa:b	xa:b	large plate
	qa:f	xa:f	twenty-seventh letter of the Urdu alphabet
	qa:ʃ	xa:ʃ	pieces, slice
	qɛ:	xɛ:	vomiting
	qɛ:d	xɛ:d	imprisonment
	qɔ:l	xɔ:l	quotation
	qɔ:^{n}m	xɔ:^{n}m	caste
m^{h}	tU^{n}m^{h}e:^{n}	tU^{n}me:^{n}	for you
n^{h}	U^{n}n^{h}e:^{n}	U^{n}ne:^{n}	for him, for her
n^{h}	U^{n}n^{h}o:^{n}	U^{n}no:^{n}	he, her; for him, for her
l^{h}	cu:l^{h}a:	cUlla	stove

Section D: Homonymy

As mentioned earlier in the Introduction, lanaguage is fundamentally a device of communication. And like other systems of communication, it conveys messages by means of

[6] For form classes and further details of meaning see glossary

signal-meaning relationships. However, unlike other communication systems, languages do not always have one to one correspondence with form and meaning. For languages exhibit a certain degree of homonymy.

As we know, homonymy is a process whereby a word assumes the form of another word, but maintains clear distinction at the level of meaning. Thus, the two completely different meanings are conveyed through same phonic form. Inasmuch as homonymy creats communicative problem, human beings utilize their intelligence to infer the correct meaning of the word through context. Furthermore, some degree of homonymy is tolerated in languages, but there is a tendency to avoid large-scale homonymy nevertheless.

Section D1: Word Final Deaspiration and Homonymy

As we have mentioned earlier that the word final aspriation is disfavored in terms of both physiology and human behavior. As a result of this disfavoring, we are encountered with a vast skewing against the final occurrence of aspirated stops. It is noteworthy that this large-scale word final deaspiration is responsible to produce only a small number of homonymous pair of words. This is clearly evident from the following examples:

Finally Deaspirated CVC Words of Deccani Urdu

Serial No.	Deccani Urdu	Standard Urdu	Gloss
1.	Ad	Ad^{h}	half
2.	UT	UT^{h}	get up
3.	a:d	a:d^{h}	half
4.	a:T	a:T^{h}	eight
5.	u:b	u:b^{h}	be fed up
6.	o:R	o:R^{h}	cover with
7.	a:^{n}k	a:^{n}k^{h}	eye
8.	ɔ:^{n}ŋg	ɔ:^{n}ŋg^{h}	doze
9.	pAR	pAR^{h}	read
10.	pUT	pUT^{h}	upper arm
11.	pUc	pUc^{h}	be wiped
12.	pA^{n}ŋk	pA^{n}ŋk^{h}	feather
13.	pi:T	pi:T^{h}	back
14.	pu:c	pu:c^{h}	ask
15.	po:c	po:c^{h}	wipe
16.	pu:^{n}c	pu:^{n}c^{h}	tail
17.	bAR	bAR^{h}	increase, grow
18.	bIc	bIc^{h}	be spread
19.	bUd	bUd^{h}	Wednesday
20.	bUd	bUd^{h}	Lord Buddha
21.	bUj	bUj^{h}	be extinguished
22.	ba:g	ba:g^{h}	tiger

23.	ba:R	ba:R^{h}	flood
24.	bu:j	bu:j^{h}	know
25.	bo:j	bo:j^{h}	load
26.	bɛ:T	bɛ:T^{h}	sit down
27.	ba:^{n}d	ba:^{n}d^{h}	embankment
28.	ba:^{n}d	ba:^{n}d^{h}	bind
29.	ba:^{n}j	ba:^{n}j^{h}	barren
30.	ba:^{n}nd	ba:^{n}nd^{h}	bind
31.	b^{h}i:k	b^{h}i:k^{h}	begging
32.	b^{h}u:k	b^{h}u:k^{h}	hunger
33.	tUj	tUj^{h}	thee, you (obl. sg. of tu:)
34.	t^{h}a:	t^{h}a:h	depth
35.	dIk	dIk^{h}	be seen
36.	dUk	dUk^{h}	sorrow, grief
37.	da:R	da:R^{h}	jaw-tooth
38.	du:d	du:d^{h}	milk
39.	de:k	de:k^{h}	see
40.	T^{h}a:T	T^{h}a:T^{h}	plenty
41.	De:R	De:R^{h}	one and a half
42.	D^{h}i:T	D^{h}i:T^{h}	stubborn
43.	cAk	cAK^{h}	taste
44.	cAR	cAR^{h}	climb
45.	cIR	cIR^{h}	be irritated

46.	cUb	cUb^{h}	be pricked
47.	c^{h}AT	c^{h}AT^{h}	sixth day of a lunar fortnight
48.	c^{h}a:^{n}c	c^{h}a:^{n}c^{h}	buttermilk
49.	ji:b	ji:b^{h}	tongue
50.	je:T	je:T^{h}	husband's elder brother
51.	ja:^{n}ŋg	ja:^{n}ŋg^{h}	thigh
52.	j^{h}u:T	j^{h}u:T^{h}	lie
53.	kAR	kAR^{h}	be embroidered
54.	kUc	kUc^{h}	few
55.	kUR	kUR^{h}	be annoyed
56.	ka:T	ka:T^{h}	wood
57.	ka:c	ka:c^{h}	the upper part of the thigh
58.	ka:R	ka:R^{h}	embroider
59.	ku:c	ku:c^{h}	few
60.	ko:k	ko:k^{h}	womb
61.	ko:R	ko:R^{h}	leprosy
62.	gAc	gAc^{h}	agree
63.	gAR	gAR^{h}	fort, castle
64.	gId	gId^{h}	vulture
65.	ga:b	ga:b^{h}	pregnant
66.	gu:t	gu:t^{h}	thread, plait
67.	go:R	go:R^{h}	dig, scarp

68.	ga:^{n}T	ga:^{n}T^{h}	knot, bundle
69.	mAR	mAR^{h}	cover
70.	mA^{n}j	mA^{n}j^{h}	be cleaned
71.	ma:T	ma:T^{h}	a species of pot-herb or vegetable
72.	ma:g	ma:g^{h}	eleventh month of the Hindu calendar
73.	me:g	me:g^{h}	cloud
74.	mu:^{n}c	mu:^{n}c^{h}	mustache
75.	mu:^{n}ŋg	mu:^{n}ŋg^{h}	kind of pulse
76.	nAt	nAt^{h}	nose-ring
77.	nIb	nIb^{h}	be managed
78.	sIk	sIk^{h}	Sikh
79.	sUb	sUb^{h}	morning
80.	sUk	sUk^{h}	comfort
81.	sa:t	sa:t^{h}	together
82.	sa:T	sa:T^{h}	sixty
83.	si:d	si:d^{h}	crease
84.	si:k	si:k^{h}	learn
85.	su:j	su:j^{h}	be seen
86.	su:k	su:k^{h}	dry; become dry
87.	se:T	se:T^{h}	businessman
88.	so:T	so:T^{h}	dry ginger
89.	so:k	so:k^{h}	soak

90.	sa:^{n}j	sa:^{n}j^{h}	evening
91.	si:^{n}ŋg	si:^{n}ŋg^{h}	horn
92.	su:^{n}ŋg	su:^{n}ŋg^{h}	smell, sniff
93.	ha:t	ha:t^{h}	hand
94.	ho:^{n}T	ho:^{n}T^{h}	lips
95.	lAT	lAT^{h}	bamboo
96.	llk	llk^{h}	write
97.	lA^{n}NT	lA^{n}NT^{h}	stupid
98.	la:k	la:k^{h}	Lakh: one hundred thousand
99.	lo:t	lo:t^{h}	incapacitated
100.	la:^{n}ŋg	la:^{n}ŋg^{h}	jump (over)
101.	rAt	rAt^{h}	chariot
102.	rAk	rAk^{h}	keep
103.	ra:k	ra:k^{h}	ashes
104.	ri:R	ri:R^{h}	back-bone, spine
105.	ru:T	ru:T^{h}	displeased

Homonymous Pairs Created by the Dropping of Final Aspiration in Deccani Urdu

Serial No.	Homonymous Pairs[7]	Gloss
1.	a:T	eight
	a:T	close, stop

[7] First member of each pair has dropped final aspiration, resulting into homonymous pair of words.

2.	pAR	read
	pAR	lie down, fall down
3.	pi:T	back
	pi:T	beat
4.	bAR	grow
	bAR	banyan tree, Indian fig-tree
5.	cAR	climb, mount
	cAR	sound to tearing
6.	c^hAT	sixth day of a lunar fortnight
	c^hAT	be picked out
7.	ka:T	cut, bite
	ka:T	wood, timber
8.	ko:R	leprosy
	ko:R	dig
9.	gAR	fort, castle
	gAR	penetrate, pierce
10.	sIk	Sikh
	sIk	be warmed, be roasted
11.	sa:t	seven
	sa:t	together, alongwith
12.	sa:T	sixty

	sa:T	stick, join
13.	su:j	be seen
	su:j	swell
14.	hAT	obstinacy
	hAT	retreat
15.	lAT	bamboo; stick
	lAT	lock of hair

Section D2: Homonymy Caused by the Merger of Post Dorsal q

As pointed out in the section on phonological merger, the post dorsal q has merged with back dorsal x in Deccani Urdu. As a result of this merger, we find here a pair of homonymous words viz, xa:b 'dream', xa:b 'large plate'. It is worth noting that here we get only a pair of words which again support our view that languages have a tendency to avoid large-scale homonymy.

Section E: Summary and Conclusions

In this chapter, an attempt has been made to appraise the role of communication in the phonology of Deccani Urdu. We have done this by examining the non-random distribution of the phonological units both syntagmatically and paradigmatically.

In section A, we have analyzed the impact of communication on the paradigm of most of the phonological units presented in the phonological grid of Deccani Urdu (Cf.

Diagram I-1). In addition, we have also presented the "phonemic inventory" of Deccani Urdu (cf. Diagram II-1), which has been established by way of contrast through minimal and subminimal pair of words. This is purely based on communication.

Section B is devoted to examining the combinatory pattern of the phonological units that is again motivated by communication. Here we have shown that how consonantal interchange in the CVC words forms a new word which has a different meaning in Deccani Urdu. Here we have also assessed the impact of communication and the hierarchy of adrotiness of articulator for the relative preference among stops liquids, and nasals in the CVC words of Hyderabad dialect of Deccani Urdu. Furthermore, we have shown through statistical support that the voiceless unaspirated stops are preferred over voiced unaspirated stops and the voiceless unaspirated stops are favored over their voiceless aspirated counterparts in the word final position which is clearly motivated by the low communicative load at this position. In all these instances we also found that the favored phonological units are additionally favored at the expense of the disfavored units in the word final position. Nevertheless, the preference of favored units is slightly reduced to the advantage of the disfavored units in the initial position of the word. This divergence in the distribution of phonological units

in the two positions of the word is brought about by communicative factor.

In section C, we have dealt with the phonological merger of some consonantal units in Deccani Urdu. The phonological units that are merged with the neighboring units, occur in a very limited number of words and hence, they have low communicative load.

Section D is devoted to dealing with homonymy which creates a communicative problem. Therefore languages have a tendency to avoid large-scale homonymy. Here we have shown that even a large-scale word final deaspiration has produced only a few pairs of homonymous words in Deccani Urdu. In addition, we have also seen that the consonantal merger forms only one pair of homonymous words, which can easily be tolerated in Deccani Urdu.

To conlcude:

(1) The phonological units of Deccani Urdu are established through contrast in minimal and subminimal pairs of words in terms of meaning (communication).

(2) The different permutations and combinations of these phonological units may form a new word in a language. Thus, the interchange of consonantal order may also produce separate signals for the signal-meaning (*signes*) units in Deccani Urdu. Therefore the multiplicity of signals achieved through the economic use of the phonological units in

combinatory phonology is responsible for effective and successful communication.

(3) The word initial position is characterized by greater communicative load. In contrast, the word final position is communicatively less important. As a result, there is a partial 'neutralization' of voiceless-voiced contrast among the unaspirated stops (in favor of voiceless stops) and of unaspirated and aspirated contrast among the voiceless stops (in favor of unaspirated stops)in Deccani Urdu. This word final contrast is totally neutralized in some other languages for communicative reasons. Therefore, Trubetzkoy's concept of 'neutralization' can be explained in terms of communication.

(4) The phonological units which have low communicative load are likely to merge with the neighboring phonological units which are characterized with high communicative load. Therefore, we have found a few examples of phonological merger in Deccani Urdu.

(5) Finally, we have presented a list of homonymous words created as a result of final deaspiration and phonological merger in Deccani Urdu. Since homonymy is responsible for creating communicative problem, there is also a tendency in Deccani Urdu, as in any other language or dialect, to avoid it.

CHAPTER IV
THE IMPACT OF VISION ON THE PHONOLOGY OF DECCANI URDU

CHAPTER IV

THE IMPACT OF VISION ON THE PHONOLOGY OF DECCANI URDU

As we have discussed in the theoretical background in the Introduction, vision plays a significant role in the human communication. Inasmuch as the labia, the visible vocal organs, also play an important role in the phonology of a language, the vision has been included among the five orienting (theoretical) principles of the Columbia School of Linguistics.

In Chapter III on communication, we have established that the initial position of the word carries the greatest communicative load, and that this load is progressively decreased as we reach the end (final position) of the word, which carries the minimum communicative load. As a result, there is a competitive use of all consonantal units (apical, labial, dorsal, medial) in word initial position in Deccani urdu, not with standing the over-all preference for the apical consonants in terms of the hierarchy of adroitness of articulators. In contradistinction, only the simpler, less complex consonantal units, preferably the apicals t n s l r, are widely used in word final position. But there still remain some consonantal skewings that cannot be explained by the

interaction of physiology and human behavior with communication alone, without bringing in the vision as an orienting principle.

It is noteworthy that word initial position is also highly important from the viewpoint of vision. The use of any of the labial consonants (p p^h b b^h m etc.) at the beginning of a word, makes the identification of that word easier through the visibility of the labial articulation. For this visible articulation acts as a strong initial cue in the identification of the word through anoustic perception. Thus, it may not be a coincidence that the infants first master the words mama and papa. We therefore expect that the labial consonants articulated by the clearly visible labia, are likely to be preferred over the non-labial consonants, including the apicals (t t^h d d^h n etc.) in the initial position of the word in Decanni Urdu.

The word final position that carries the minimum communicative load, is also insignificant from the viewpoint of vision. We therefore expect that this position will predominantly be filled by the apico-dental consonants (t n s l r etc.) preferred in terms of the hierarchy of adroitness, and by the voiceless unaspirated stops (p t k etc.) preferred in terms of fewer *versus* more articulators.

On the basis of our discussion above, we need to compare the occurrences of the labial and the non-labial

consonants as they obtain in the initial and final positions of the words in Deccani Urdu. This is taken up in section A. In section B, we present the summary and the conclusions with regard to the impact of vision on the phonology of Deccani Urdu.

Section A: Labial *versus* Non-Labial Units in Word Initial and Final Positions

With a view to assessing the role of vision, we present the frequency of occurrence of the Labial consonants with that of the apical, dorsal and medial consonants in both the initial and the final positions of the word in Deccani Urdu. This is taken up in two sections. In section A1, we compare the frequencies of the Labial and the non-Labial stops in the initial and final positions of the monosyllabic words. In section A2, the labial *versus* the non-labial nasals are compared in their frequency of usage in the initial and final positions of the monosyllabic words.

Section A1: Labial *versus* Non-Labial Stops in the Initial and Final Positions of the Monosyllabic Words

In this section, we examine the role of vision with reference to the favoring and disfavoring in the frequency of the labial and the non-labial stops in the initial and final positions of all the monosyllabic words and then of only the CVC words, separately.

In Table IV-1, we present the actual occurrences of the labial *versus* the non-labial stops as they appear in the initial and final positions of the monosyllabic words in Deccani Urdu.

Stops	Initial %	Initial No	Initial %	Final %	Final No	Final %	Total %	Total No	Total %
Labial p p^h b b^h	31.05	331	74.38	14.54	114	25.62	24.05	445	100
Apical t t^h d d^h T T^h D D^h	28.05	299	46.87	43.24	339	53.13	34.49	638	100
Dorsal k k^h g g^h	21.76	232	53.09	26.15	205	46.91	23.62	437	100
Medial c c^h j j^h	19.14	204	61.82	16.07	126	38.18	17.84	330	100
Total	100	1066	57.62	100	784	42.38	100	1850	100

Table IV-1: Labial *versus* Non-Labial stops in the Initial and Final Positions of the Monosyllabic Words.

Comments on Table IV-1

Comment 1: Labial and Non-Labial Stops in Word Initial Position

As seen in this table, of the 1066 occurrences of the stops in the initial position of all the monosyllabic words, the labials (p p^h b b^h) have 331 occurrences, followed by the apicals (t t^h d d^h; T T^h D D^h) 299 occurrences, the dorsals (k k^h g g^h) 232 occurrences and the medials (c c^h j j^h) 204

occurrences. As these figures indicate, there is a competitive use of all four types of stops in this communicatively important position of the word. Further, it is noteworthy that the labial stops appear in almost one-third of all the stop occurrences combined, in this visually important position of the word. It cannot be a coincidence that the labials predominate the apicals in this position, despite the overwhelming preference of the apical stops in terms of the hierarchy of adroitness of articulators. The extraordinary preference for the labial stops in word initial position can only be explained by the visibility factor of the labial articulator.

Comment 2: Labial and Non-Labial Stops in Word Final Position

As shown in Table IV-1, of the 784 occurrences of stops in the final position of the monosyllabic words, there are 114 labials, 339 apicals, 205 dorsals, and 126 medials. In this communicatively least important position of the word, it is noteworthy that there is a strong impact of the hierarchy of adroitness of articulators in the distribution of apical, dorsal and medial stops. As seen in the figures, the apicals alone here appear in over two-fifth of all stop types combined. The only extraordinary skewing in terms of the hierarchy of adroitness, in this position, is that rather than compacting well with the dorsals, the labials (114) appear in a ratio of almost 1 to 2 the dorsals (205). In fact, the labials, as shown by the

figures in the table, are the least favored of all four stop types in word final position. This extraordinary disfavoring for the labial stops in Deccani Urdu, may well have been brought about jointly by two factors, the minimum communicative load and the inverse impact of the visibility of the labia, at the end of the word.

Comment 3: Labial and Non-Labial Stops in Word Initial and Final Positions.

As seen in Table IV-1, of the 445 occurrences of the labial stops, 331 appear in the initial position of the word, whereas only 114 appear in the final position. That is, the initial labial stops occur in a ratio of almost 3 to 1 the final labial stops. As we have noted in the comments above, this extraordinary skewing in favor of the word initial labials and against the word final labials, is fully justified by the visibility factor of the labial articulator. As we have pointed out above, this vast skewing is also in part supported by the polar communicative load of word initial and word final positions, and by the impact of the hierarchy of adroitness of articulators, particularly the most adroit apex.

In opposition to the labial stops, the non-labial stops generally conform to the norms established in terms of hierarchy of adroitness, and of the communicative load in the word. Thus, as seen in the table, the seale of adroitness relationship for the apicals (high), the dorsals (mid) and the

medials (low) is maintained in the frequency of occurrence in both the initial and the final position of the word. The only difference is that whereas there is a competitive use of the apical, dorsal, and medial stops in word initial position in response to the maximum communicative load there, we observe a sharp skewing in favor of the apicals and against the dorsals and the medials in word final position that carries the minimum communicative load.

As seen in the table, the dorsals have 232 occurrences in the initial position and 205 in the final position. Further, the medals have 204 occurrences in the initial position and 126 in the final position. That is, the frequency of occurrence for both the dorsals and the medials is higher in the initial position, but it goes down in the final position. Unlike the dorsals and the medials, it is noteworthy that the frequency of occurrence for the apicals, which is significantly high in the initial position, is further increased substantially in the final position. Of the 638 occurrences of the apical stops, 299 appear in word initial position and a much higher figure, 339 occur in word final position. This sharp skewing in favor of the apicals in word final position is brought about by the preference of apex as the most adroit articulator in the context of a communicatively and visually disfavored final position of the word.

We know compare the frequency of occurrence of the labial and the non-labial stops in the initial and final positions of only the CVC words in Deccani Urdu. This frequency count is presented in Table IV-2.

Stops	Initial			Final			Total		
	%	No	%	%	No	%	%	No	%
Labial	31.05	304	73.97	16.02	107	26.03	24.95	411	100
Apical	27.27	267	48.63	42.22	282	51.37	33.33	549	100
Dorsal	22.17	217	57.11	24.40	163	42.89	23.08	380	100
Medial	19.51	191	62.21	17.36	116	37.79	18.64	307	100
Total	100	979	59.44	100	668	40.56	100	1647	100

Table IV-2. Labial *versus* Non-Labial Stops in the Initial and Final Positions of the CVC Words.

Comments on Table IV-2

Comment 1: Labial and Non-Labial stops in Word Initial Position

As seen in this table, of the 979 occurrences of the stopes in the initial position of the CVC words, the labials have 304 occurrences, followed by the apicals 267 occurrences, the dorsals 217 occurrences, and the medials

191 occurrences. As these figures indicate, there is a competitive use of all four types of stops in this communicatively important position of the word. Further, it is noteworthy that the labial stops appear in almost one-third of all the CVC stop occurrences combined, in this visually important position of the word. This extraordinary preference for the labial stops *vis-a-vis* the apical stops in the word initial position is here again attributed to the visibility factor of the labial articulator.

Comment 2: Labial and Non-Labial Stops in Word Final Position

As shown in Table IV-2, of the 668 occurrences of stops in the final position of the CVC words, there are 107 labials, 282 apicals, 163 dorsals, and 116 medials. In this communicatively least important position of the word, it is noteworthy that there is a strong impact of the hierarchy of adroitness of articulators in the distribution of apical, dorsal and medial stops. As seen in the figures, the apicals alone here appear in over two-fifth of all the CVC stop types combined. The only extraordinary skewing in terms of hierarchy of adroitness in this position, is that rather than competing well with the dorsals, the labials (107) appear in a ratio of almost 1 to 1½ the dorsals (163). In fact, the labials, as shown by the figures in the table, are the least favored of all four stop types in word final position. The rationale for this

extraordinary disfavoring for the labial stops is the same as that provided earlier in comment 2 of Table IV-1.

Comment 3: Labial and Non-Labial Stops in Word Final Position

As seen in Table IV-2, of the 411 occurrences of the labial stops, 304 appear in the initial position of the word, whereas only 107 appear in the final position. That is, the initial labial stops occur in a ratio of over 2¾ to 1 the final labial stops. The rationale for this extraordinary skewing in favor of the word initial labials and against the word final labials remains the same as that presented in comment 3 of Table IV-1.

In opposition to the labial stops, the non-labial stops generally conform to our expectations in terms of the hierarchy of adroitness, and of the communicative load in the word. Thus, as seen in the table, the scale of adroitness relationship for the apicals, the dorsals and the medials is maintained in the frequency of occurrence in both the initial and the final position of the word. The only difference is that whereas there is a competitive use of the apical, dorsal, and medial stops in word initial position in response to the maximum communicative load there, we observe a sharp skewing in favor of the apicals and against the dorsals and the medials in word final position that carries the minimum communicative load. This sharp skewing in favor of the

apicals in word final position is brought about by the preference of the apex as the most adroit articulator in the context of a communicatively and visually disfavored final position of the word.

Section A2: Labial *versus* Non-Labial Nasals in the Initial and Final Positions of the Monosyllabic Words.

In this section, we evaluate the impact of vision with reference to the favoring and disfavoring in the frequency of occurrence of the labial and the non-labial nasals in the initial and final positions of all the monosyllabic words, and then of only the CVC words, separately. We present below the actual occurrences of the nasal consonants as they appear in the initial and final positions of the monosyllabic words in Deccani Urdu, in Table IV-3.

Nasals	Initial			Final			Total		
	%	No	%	%	No	%	%	No	%
Labial m	54.05	80	54.42	32.06	67	45.58	41.18	147	100
Apical n;N	45.95	68	37.99	53.11	111	62.01	50.14	179	100
Dorsal ŋ	0	0	0	14.83	31	100	8.63	31	100
Medial ñ	0	0	0	0	0	0	0	0	0
Total	100	148	41.46	100	209	58.54	100	357	100

Table IV-3: Labial versus Non-Labial stops in the Initial and Final Positions of the Monosyllabic Words.

Comment on Table IV-3

Comment 1: Labial and Non-Labial Nasals in Word Initial Position

As seen in this table, of the 148 occurrences of the nasals in the initial position of all the monosyllabic words, the labial nosal (m) has 80 occurrences, the apical nasal 68 occurrences (apico-dental n 68 and apico-palatal N 0), dorsal nasal (ŋ) 0 occurrence, and the medial nasal (ñ) 0 occurrence. As these figures indicate, there is a sharp skewing in favor of the labial nasal *vis-a-vis* the apical nasals, in this visually and communicatively important position of the word. It is therefore not surprising that the labial nasal m predominates the apical nasals (n;N), despite the overwhelming preference of the apicals in terms of the hierarchy of adroitness of articulators. The extraordinary preference for the labial nasal and against the apical nasals in word initial position can only be explained by the visibility factor of the labial articulator.

Finally, it is noteworthy that of the five nasal consonants (m n N ñ ŋ), only the labial m (preferred in terms of vision), and the apico-dental n (favored in terms of the adroitness and precision of control) are used in the initial position of the monosyllabic words in Deccani Urud. The apico-palatal N, the

medial ñ, and the dorsal ŋ do not occur in the initial position of these words. In this regard, it may also be pointed out that the dorsal (ñ) is a marginal phoneme which appears in word final position, and also before a dorsal consonant. The medial nasal (ñ) of Deccani Urdu, is a positional variant that occurs only before the medial consonants in a limited number of words. The apico-palatal nasal (N) is also a positional variant of limited occurrence that appears only before the apico-palatal consonants.

Comment 2: Labial and Non-Labial Nasals in Word Final Position

As shown in Table IV-3, of the 209 occurrences of the nasal consonants in the final position of the monosyallbic words, there are 67 occurrences of the labial nasal, 111 of the two apical nasals, 31 of the dorsal nasal, and 0 of the medial nasal. These figures clearly indicate that there is an impact of the hierarchy of adroitness, in the distribution of the apical, labial, dorsal and medial nasals. The apicals appear in a ratio of over 1½ to 1 the labials in the final position of the word. Further, it may be noted that rather than going down further in their frequency of usage the labial m appears in a ratio of over 2 to 1 the dorsal ɳ (31) in word final position. But the problem lies with the dorsal nasal and not with the labial nasal. As we have noted in comment 1 above, the dorsal ɳ is a marginal phoneme in Deccani Urdu.

Comment 3: Labial and Non-Labial Nasals in Word Initial and Final Positions

As seen in Table IV-3, of the 147 occurrences of the labial nasal (m), 80 appear in the initial position of the word, whereas only 67 appear in the final position. This sharp skewing in favor of the word initial labial m and against the word final labial m, is fully justified by the visibility factor of the labial articulator. Further, this sharp skewing is also in part supported by the polar communicative load of word initial and word final positions, and by the impact of the hierarchy of adroitness of articulators, particularly the most adroit apex.

It is noteworthy that the frequency of occurrence for the apicals, which is significantly high in the word initial position, is further increased substantially in the final position. As seen in the figures, of the 179 occurrences of the apical nasals (n;N), 68 appear in word initial position and a much higher number, 111 occur in word final position. This sharp skewing in favor of the apicals in word final position is brought about by the preference of the apex as the most adroit articulator in the context of a communicatively and visually disfavored final position of the word.

We now compare the frequency of occurrence of the labial and the non-labial nasals in the initial and final positions of only the CVC words in Deccani Urdu. This frequency count is presented in Table IV-4.

Nasals	Initial % No %	Final % No %	Total % No %
Labial m	53.13 68 54.84	28.87 56 45.16	38.15 124 100
Apical n;N	46.87 60 35.93	55.16 107 64.07	51.86 167 100
Dorsal ŋ	0 0 0	15.97 31 100	9.63 31 100
Medial ñ	0 0 0	0 0 0	0 0 0
Total	100 128 39.75	100 194 60.25	100 322 100

Table IV-4: Labial *versus* Non-Labial Nasals in the Initial and Final Positions of the CVC Words.

Comments on Table IV-4

Comment 1: Labial and Non-Labial Nasals in Word Initial Position.

As seen in this table, of the 128 occurrences of the nasal consonants in the initial position of the CVC words, the labial nasal (m) has 68 occurrences, apical nasals (n;N) have 60 occurrences (apico-dental n 60, apico-palatal N 0), dorsal nasal (ŋ) 0 occurrence and medial nasal (ñ) 0 occurrence. As these figures indicate, there is a modest skewing in favor of the labial nasal and against the apical nasals, in this visually

and communicatively important position of the word. It is not a coincidence that the labial m is used more frequently than the apical n and N in this position, despite the overwhelming preference of the apical nasals interms of the hierarchy of adroitness of articulators. The rationale for this modest skewing in favor of the labial nasal in word initial position can only be accounted for by the visibility factor of the labial articulator.

Finally, it may be noted that of the two apical nasals--n, N--, only the apico-dental n occurs in the CVC words in Deccani Urdu; there is a total skewing against the apico-palated N in the syntagmatic context of the CVC words. The medial ñ also has a 0 frequency in the CVC words. Further, the dorsal ŋ has a 0 frequency in the initial position of the CVC words.

Comment 2: Labial and Non-Labial Nasals in Word Final Position

As shown in Table IV-4, of the 194 occurrences of nasal consonants in the final position of the CVC words, there are 50 occurrences of the labial nasal (m), 107 of the apical nasals (n 107; N 0), 31 of the dorsal nasal (ŋ), and 0 of the medial nasal (ñ). As these figures indicate, the apical nasal n appears in a ratio of almost 2 to 1 the labial nasal m. This vast skewing in favour of the apical n is fully justified in view

of the extraordinary adroitness of the apex and the minimum communicative load at the end of the word.

Finally, a word about the low frequency of the dorsal nasal ŋ *vis-a-vis* the labial nasal m, in word final position. As seen in the table, the 31 occurrences of ŋ appear in a ratio of almost 1 to 2 the 56 occurrences of m. As we have noted earlier, this unexpected skewing is brought about by the marginal status of the dorsal nasal in the phonological paradigm of Deccani Urdu.

Comment 3: Labial and Non-Labial Nasals in Word Initial and Final Positions

As seen in Table IV-4, of the 124 occurrences of the labial m in the CVC words, 68 appear in the initial position of the word, whereas only 56 appear in the final position. This modest skewing in favor of the word initial m and against the word final m, is fully justified by the visibility factor of the labial articulator.

It is noteworthy that the frequency of occurrence for the apical nasal (the apico-dental n), which is significantly high in the word initial position, is almost doubly increased in the final position. As seen in the figures, of the 167 occurrences of the apical n, 60 appear in word initial position and a much higher figure, 107, occur in word final position. This drastic skewing in favor of the apicals in word final position is brought about by the preference of the apex as the most adroit

articulator in the context of a communicatively and visually disfavored final position of the word.

Section B: Summary and Conclusions

In this chapter, an attempt has been made to evaluate the impact of vision as an orienting principle on the phonology of Deccani Urdu. We have provided a motivated rationale in terms of vision for the phonological skewings observed in word initial and word final position, in favor of or against the labial *versus* non-labial consonants as they appear in the monosyllabic words of Deccani Urdu.

In section A, we have compared the frequency of occurrence for the labial consonants with that of the apical, dorsal and medial consonants, in both the initial and the final position of the monosyllabic words in Deccani Urdu. In section A1, the frequencies of the labial *versus* the non-labial among the stops have been compared with a view to evaluating the role of vision in the distribution of consonantal units in the initial and final positions of the monosyllabic words in general, and of the CVC words in particular.

The frequency counts clearly indicate that the labial stops are unusually most favored in the communicatively important word initial position, and are unusually least favored in the communicatively insignificant word final position. It is argued that this unusual skewing in the distribution of the

stops in Deccani Urdu is motivated by vision as an orienting principle.

In section A2, we have assessed the impact of vision on the frequency of occurrence of the labial *versus* non-labial among the nasal consonants in the initial and final positions of the monosyllabic words in general, and of the CVC words in particular.

As the frequency counts clearly demonstrate, the labial m becomes the most favored nasal consonant in word initial position, whereas the apical n becomes the most favored nasal consonant in word final position. Again, we argue that this unusual skewing for the labial m in the two positions of the word, is brought about by vision.

To conclude:

(1) Vision as an orienting principle makes a powerful impact on the syntagmatic distribution of consonantal units in Deccani Urdu. The clear manifestation of this impact may be seen in the drastic preference for the labial consonants in the initial position of the word in Deccani Urdu.

(2) The use of any of the labial consonants at the beginning of the word, makes the identification of that word easier through the visibility of the labial articulation. For this visible articulation acts as a strong initial cue in the proper identification of the word by acoustic perception. Therefore, the labial consonants produced by the labia (visible vocal

organs) are most productively utilized in the visually and communicatively significant word initial position.

(3) The word final position that carries the minimum communicative load in the word, is also insignificant from the viewpoint of vision. Thus, this position is predominantly filled by the apico-dental consonants (t n s l r etc.), preferred in terms of the hierarchy of adroitness of articulators, and by the voiceless unaspirated stops (p t k etc.), preferred in terms of fewer *versus* more articulators.

CHAPTER V
ACOUSTIC BASE OF DECCANI URDU PHONOLOGY

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As we have noted in the Introduction, acoustic medium is one of the five orienting principles for phonological analysis in the theoretical framework of the Columbia school of linguistics. Whereas the phonological units of Deccani Urdu, as of any other language or dialect, are established as the elemental units in terms of communication, the substantive characteristics of these units are determined by physiology and acoustics. In fact, the make-up of the phonological paradigm, the network of phonological units, as presented in Diagram I-1, is partly based on the physiologico-acoustic (substantive) characteristics of these units. Further, as we have noted many a time in this thesis, the physilogico-acoustic characteristics of the phonological units also determine the combinatory pattern of these units in the formation of the syllable and the word. It must however be noted that we have mainly dealt with the physiological characteristics of the phonological units in support of our analysis in this work. This limitation is primarily due to the fact that any experimental, acoustic research is beyond the scope of the present research.

At the same time, we feel it imperative that we deal with certain aspects of standard acoustic research that have a direct bearing on the phonology of Deccani Urdu. In this chapter, therefore, we try to gauge the impact of these select acoustic aspects on the make-up and distribution of phonological units in Deccani Urdu.

The impact of acoustic medium is presented in five sections in this chapter. In section A, we deal with the acoustic base of the clearly audible *versus* the less clearly audible distinction of apertures. In section B, we describe the formation of two resonant cavities within the supraglottal cavity, and examine the role of the two cavities in the production of vowels. In section C, we provide the acoustic rationale for the lip rounding of the back dorsal vowels. In section D, we deal with the acoustic justification for the four-way classification of stops and the impact of this classification on the frequency of usage of these stops in the monosyllabic words in Deccani Urdu. The chapter ends with the summary and conclusions in section E.

Section A: Clearly Audible *versus* Less Clearly Audible Apertures

It is well-known that the speech sounds are produced through the control of the musculature of the vocal tract. The basic requirement is that the sounds produced be sufficiently

audible, if the communication is to be transmitted from one person to another.

In terms of acoustic medium, the sound waves of speech may be divided into two categories--the clearly audible and the less clearly audible. The clearly audible speech sounds are produced, when three conditions obtain: (1) The supraglottal articulators can only shape the two vocal cavities, the back and the front. The back cavity, lying behind the medium-dorsum mass, is to be shaped by only the medium or dorsum as articulator. The front cavity, in front of the medium-dorsum mass, is to be shaped by both the medium or dorsum and the labia, as articulators. (2) The excitation for the two resonant cavities be provided by the glottis with the vibration of its vocal folds. (3) Irrespective of the variations in the size and opening of the two resonant cavities that are required by the wide range of these sounds, there should be no impediment in the flow of air coming from the lungs through the vocal tract. These three conditions for the production of the clearly audible speech sounds are realized only to apertures 4 and above. The speech sounds produced at the clearly audible apertures are traditionally known as "vowels".

The less clearly audible speech sounds, on the other hand, are produced by impeding to a greater or lesser degree the air passing through the vocal cavity by means of the supraglottal articulators. This impediment of the air flow

occurs at apertures ∅, 1, 2, and 3, with the highest degree at aperture ∅ and the lowest at aperture 3. Therefore, all the speech sounds produced at apertures zero through 3 ("stops", "fricatives", "liquids", etc.) are less clearly audible. The speech sounds produced at the less clearly audible apertures are traditionally known as "consonants".

The classification of the speech sounds in terms of audibility, has a profound impact on the syntagmatic use of these sounds, as the clearly audible and the less clearly audible phonological units of a language, in the formation of lexical morphemes. For the clearly audible units (the "vowels") of a language regularly form what Professor Diver calls the keystone in the arch of the structure of the morpheme. The less clearly audible units (the "consonants") are placed in flanking position, before and after the keystone, in the formation of the morpheme. The clearly audible and the less clearly audible units are thus termed the keystone and the flanking members in the formation of morphemes and words.

On the basis of the clearly audible *versus* less clearly audible distinction, we may classify the 60 phonological units of Deccani Urdu into 20 vocalic units and 40 consonantal units. Indeed, it is this classification that is reflected in the organization of the phonological units, as seen in the phonological grid in Diagram I-1.

A profound impact of the classification of the phonological units in terms of audibility can also be seen in how these units are organized in the formation of the syllable. It is noteworthy that only a single keystone, that is, only one vocalic unit, can appear in each syllable. In Deccani Urdu, this vocalic unit may stand alone to form a syllable, or it may be flanked by one or two consonantal units on either side of the vocalic unit. We therefore have a theoretical basis to divide the lexical units into the monosyllabic, the bisyllabic, or the longer words in Deccani Urdu. It may be pointed out that other languages may have differing organization of the syllable in terms of the number of syllables for the lexicon, and the make-up of each syllable with respect to the number of flanking members on each side of the keystone. And as we have demonstrated throughout this thesis, the frequency of occurrence for both the consonantal and the vocalic units in the monosyllabic (and longer) words, can be used to provide indirect, quantitative support to the validation of phonological analysis.

Section B: Formation of Two Resonant Cavities in the Production of Vowels

As we have discussed in medium-dorsum mass (Chapter I, section D), the production of clearly audible speech sounds (the "vowels") involves the formation of supraglottal resonant cavity in the oral chamber. This supraglottal resonant cavity

extends from the glottis to the lips. The medium-dorsum mass are used as articulators to determine the shape and size of the cavity. The medium-dorsum divides the cavity into two, the back and the front, each with its own resonant frequency. The position of the medium-dorsum determines both the size of the two cavities and the size of the opening of back cavity; the positioning of the lips determines the size of the opening of the front cavity. The resonant frequency of each cavity is of course determined by its own cavity size and size of the opening. Thus, the resonant frequency of back cavity (F1) is determined by the cavity size and size of the opening of back cavity. Likewise, the resonant frequency of the front cavity (F2) is determined by the cavity size and size of the opening of front cavity. Furthermore, each vowel is charactrized by a differing combination of the two resonant frequencies, F1 and F2. The basic inventory of distinct units is developed by varying these two frequencies and combining the variants in different ways. The excitation of the cavities continues to be provided by vibration of the vocal folds. These procedures are of course entirely consistent with the principles of acoustics as well as with the greater precision of control over the musculature.

Finally, it may be noted that the resonant cavity amplifies the acoustic distinction of vocalic units of speech. In the production of medial ("front") vowels, for example, a large

resonance cavity is formed at the back of the oral chamber, extending from the glottis to the medium. And notwithstanding the angle of the jaws, there is a sufficient vertical space for maneuver for the medium as an articulator in this triangular cavity.

This large resonant cavity is sufficient enough for the easy production and clear perception of the medial (the "front") vowels. On the contrary, a much smaller back cavity, from the glottis to the back dorsum, is formed in the production of the back dorsal (the "back") vowels. It is to be noted that the width (the vertical space) of this triangular cavity is greatly reduced because of the angle of the jaws. As a result, the "back" vowels produced by the back dorsum as an articulator, require greater precision of control in their production and an extra effort in their perception. This problem is solved by the formation of another resonance cavity in the front of the oral chamber from the back dorsum to the lips, through the rounding of the labia. For the vocalic distinctions made at the back dorsum are amplified through this front cavity. That is why it is quite natural to have back rounded vowels as opposed to front unrounded vowels in Deccani Urdu as in many other languages or dialects.

Section C: Acoustic Rationale for the Lip Rounding of Back Dorsal Vowels

As discussed above in section B, there is a definite physiologico-acoustic rationale for the use of labium as an additional articulator, through lip rounding in the production of back dorsal vowels. For a much smaller back cavity is formed in the production of back dorsal vowels due to the vertex of the angle of the jaws at the back of the oral cavity. As a result, the production of back dorsal vowels require an extra effort on the part of the speaker to maintain distinction. The impact of the angle of the jaws is neutralized by the utilization of the labia as an additional articulator for producing labio-dorsal ("back rounded") vowels. The vowels thus produced are characterized with acoustic distinctness. That is why it becomes acoustically natural for the "back rounded" vowels to have parity with the "front unrounded" vowels.

It is noteworthy that the equal number of units for medial and back dorsal vowels in the phonological paradigm of Deccani Urdu, and their competitive utilization in the syntagmatic organization of the word, clearly indicate that the asymmetry of the vocal tract affecting the back vowels is more than compensated by the interaction of labium in the production and perception of these labio-dorsal vowels.

Finally, it may be noted that the acoustic rationale for the lip rounding of back dorsal vowels provided above can also be explained with the help of formant frequencies, obtained through spectrographic analysis. The vocalic speech sounds can be acoustically analyzed and properly identified in terms of the formant frequencies (F1, F2, F3, etc.), as observed in the sound spectrograms. It should be noted that the first two formants, F1 and F2, are closely tied to the shape of the vocal tract (the volume and size of the opening of resonant cavity), as the lips and the medium-dorsum move to articulate vocalic units of speech. We, therefore, concentrate only on these two formant frequencies here.

Inasmuch as the vocalic system of Deccani Urdu ideally matches with that of Mewati Urdu[8] we are reasonably sure that the formant frequencies of the respective vowels for both the dialects is same. We present the formant frequencies (F1 and F2) of long and short vowels separately in Table V-1, and Table V-2 below.

Vocalic Units	F1	F2
iː	250	1900
eː	300	1850
ɛː	600	1500
aː	700	1100
ɔː	400	900
oː	400	850
uː	250	800

[8] We have taken figures for formant frequencies from Dr. A. R. Fatihi's work on Mewati Urdu phonology (1987).

Table V-1: Formant Frequencies of Long Vowels

Comments on Table V-1

Comment 1: As seen in the first formant (F1) frequencies, in the table above, it is difficult to distinguish "front" vowels from "back" vowels. For example, in case of vowel i: and u:, the first formant (F1) frequency is same (250 Hz.). Thus, the acoustic cues for F1 are not of much help in distinguishing the "front" vowel (i:) from "back" vowel (u:).

It may also be observed that F1 for the back vowels ɔ: and o: is same (400 Hz.). Here again the cues of F1 do not help in distinguishing these long "back" vowels.

Comment 2: As seen in the second formant (F2) frequencies of the long vowels in the table above, there is a gradual decrease in the F2 frequencies from i: to u:. That is, it is easier to distinguish "front" vowels from the opposing "back" vowels in terms of the acoustic cues of second formant (F2) frequencies. This acoustic distinction is obtained by bringing down F2 frequencies of the back dorsal vowels. This is done by expanding the front cavity through the rounding of the lips in the production of back dorsal vowels. As a result, lip rounding becomes an essential device for making acoustic distinction within the back dorsal vowels, as well as between the medial and the back dorsal vowels.

Vocalic units	F1	F2
I	200	1800
A	300	950
U	260	600

Table V-2: Formant Frequencies of Short Vowels

Comment on Table V-2

Comment 1: As seen in the first formant (F1) frequencies of the short vowels in the table above, a slight variation in the frequencies of F1 makes it difficult to distinguish medial vowel I (200 Hz.) from back dorsal vowel U (260 Hz.). Thus, the F1 cues are not of much significance in distinguishing "front" vowels from "back" vowels.

Comment 2: As seen in the second formant (F2) frequencies of the short vowels in the table above, there is a sharp difference between the second formant frequencies of the "front" and the "back" vowels. Thus, it is easier to distinguish the "front" vowels from the opposing back vowels in terms of F2 frequencies.

It may also be noted that the acoustic distinction between the vowel u: and U can also be made only in terms of second formant frequencies. This difference in the F2 is again attributed to the lip rounding in the production of back dorsal vowels. That is why rounding of the "back" vowels and the converse unroundedness of the "front" vowels is so naturally widespread in the languages of the world.

Section D: The Four-way Classification of Stops

The 20 stops of Deccani Urdu are traditionally classified into four types:

Voiceless unaspirated:	p	t	T	c	k
Voiceless aspirated:	p^h	t^h	T^h	c^h	k^h
Voiced unaspirated:	b	d	D	j	g
Voiced aspirated:	b^h	d^h	D^h	j^h	g^h

This traditional four-way classification of stops is justified in view of the distinctiveness of the four classes that are established by communicative contrast. However, we do not follow the simple combinatory relation of voicing, voicelessness, aspiration, and absence of aspiration that is implicit in the traditional terminology. Particularly, the "voiced aspirated stops" are not formed by adding aspiration to the "voiced unaspirated stops".

It may be noted that two Haskins sholars, namely, Leigh Lisker and Arthur S. Abramson, have done pioneering acoustic research on the stop categories in various langauges. They have successfully demonstrated that a three-way distinction of stops--the voiced unaspirated, the voiceless unaspirated, and the voiceless aspirated--is possible through the single acoustic variable of voice onset time (VOT) continuum. They have shown through their meticulous measurements that the voicing starts immediately after the release of the voiceless unaspirated stops.

In contradistinction, the voiced unaspirated stops are marked by the voicing lead before their release, whereas the voiceless aspirated stops are characterized by the voicing lag after their release. At the same time, the two researchers have acknowledged that the characteristics of the voiced aspirated stops, which are found in the four-way classification of stops in some Indo-Aryan languages, cannot be accounted for by the voice onset continuum alone.

However, it may not be in conformity with our phonological principles to analyze the four-way distinction of stops, as encountered in Deccani Urdu, in terms of the voice onset time. As noted above, the characteristics of the voiced aspirates cannot be accounted for by the voice onset continuum alone. Further, it is noteworthy that there are quite a few other physiologico-acoustic (substantive) characteristics of the four stop types that must be taken into account for a fuller analysis of these stop types. For, as we have emphasized many a time in the present research, both substance and value are equally important for the phonological analysis in the theoretical framework of the Columbia school of linguistics.

As shown in the phonological grid (Diagram I-1), all four types of stops are alike in having ∅ aperture for the supraglottal articulators. The combination of these articulators with ∅ degree of aperture, shapes the vocal cavity for the

production of all four types of stops in Deccani Urdu. All these stops also share the excitation of the vocal cavity by explosion that is produced by release of the blockage formed in the oral cavity by the supraglottal articulators. At the same time, the four types are differentiated from each other by the differing uses of the glottal articulator.

The voiceless unaspirated stops (p t k etc.) are the simplest phonological units in that they are produced by the shaping and excitation of the vocal cavity by the supraglottal articulators alone; the glottal articulator is not involved in the production of these stops.

The other three types are characterized by additional excitation of the vocal cavity by the glottal articulator. The voiced unaspirated stops (b d g etc.) include excitation of the vocal cavity by the glottal articulator at aperture 1. The voiceless aspirated stops (p^h t^h k^h etc.) include excitation of the vocal cavity by the glottal articulator at aperture 2. The voiced aspirated stops (b^h d^h g^h etc.) include excitation of the vocal cavity by the glottal articulator at aperture 1½.

As it should be clear from our discussion above that whereas the voiced unaspirated, the voiceless aspirated, and the voiced aspirated stops are alike in having an extra articulator, the glottis, the three stop types are to be differentiated from one another in terms of the glottal

configurations assumed at aperture 1,2, and 1½ respectively. (For further details, cf. Chapter I, Diagram I-1, comment 10.)

As noted above, the voiceless unaspirated stops (p t k etc.) are the simplest of the four types, in that they are produced by the supraglottal articulators alone. In view of the common human trait of favoring the simpler task over the more complex, we expect that the voiceless unaspirated stops will be preferred over the other three types of stops.

Whereas the other three types of stops are equally complex in terms of the number of articulators, they are differentiated from one another in the dynamics of their glottal articulation. Of these three, the voiced unaspirated stops (b d g etc.) are naturally produced in combination with the glottal articulator at aperture 1. It is noteworthy that this glottal articulation of V(oice) is also utilized by human beings for non-linguistic expression. Inasmuch as they are the least complex among the three stop types, the voiced unaspirated stops will be preferred over the other two types of stops in terms of human behavior.

The voiceless aspirated stops (p^h t^h k^h etc.) are also naturally produced in combination with the glottal articulator at aperture 2. For this glottal articulation, which generates voiceless A(spiration), is also produced by human beings in hard breathing. But as this hard breathing requires a rush of air from the lungs, this extra effort in the production of the

voiceless aspirated stops makes them less favored than the voiced unaspirated stops.

Of the three complex types of stops, the voiced aspirated stops (b^h d^h g^h etc.) are extraordinarily complex, for they are produced in combination with a difficult glottal articulation, the voiced h. It is noteworthy that the production of the voiced h requires an unnatural configuration of the glottis at aperture 1½, as this glottal articulation is not used by human beings for any non-linguistic expression. In view of the extraordinary complexity in their articulation, the voiced aspirated stops are the least favored among all four types of stops in Deccani Urdu.

On the basis of our discussion above, we may construct the scale of preference for the placement of the four types of stops in Deccani Urdu. This scale is presented in Diagram V-1.

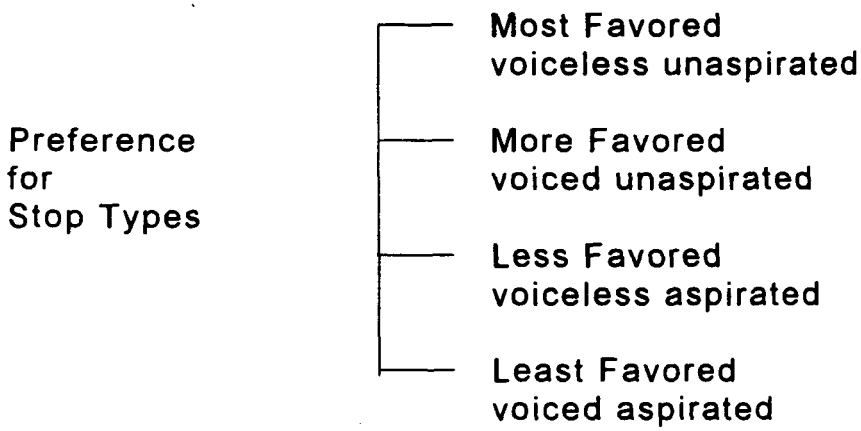

Diagram V-1: Scale of Preference for the Four Types of Stops

With a view to assessing the impact of the scale of preference, as diagrammed above, we now present the actual distribution of the four types of stops in the number of units and the frequency of their usage in the monosyllabic words in Deccani Urdu.

Stop Types	Units	Frequency of usage				Stop Types
		No.	%	No.	%	
Voiceless Unaspirated p t T C k	5	868	46.59	1503	80.68	Unaspirated
Voiced Unaspirated b d D j g	5	635	34.08			
Voiceless Aspirated p^h t^h T^h c^h k^h	5	208	11.17	360	19.32	Aspirated
Voiced Aspirated b^h d^h D^h j^h g^h	5	152	8.16			
Total	20	1863	100	1863	100	Total

Table V-3: Favoring and Disfavoring in the Four-way Distribution of Stops in the Monosyllabic Words

Comment on Table V-3

Comment 1: As seen in the table above, the 20 stop units of Deccani Urdu are equally distributed among the four stop types. That is, we have 5 voiceless unaspirated stops, 5 voiced unaspirated stops, 5 voiceless aspirated stops, and 5 voiced aspirated stops. This parity in the number of units for

the four stop types is against our expectations in terms of the scale of preference as presented in Diagram V-1. The symmetrical distribution of the units in a particular phonological paradigm should not surprise us. For in the case of the number of units, the physiologico-acoustic and human traits are often sidelined by the powerful impact of communication. As we have explained in Chapter III, the communicative principle dictates that, as far as possible, all intersections of the phonological paradigm be filled by phonological units. Alternatively, an axis of the paradigm may be totally eliminated, if it is filled by just one phonological unit.

For example, in both classical Urdu and modern standard Urdu, there is only one asymmetry in the number of units. The simplest stop type, namely, the voiceless unaspirated, has 6 units (p t T c k q), whereas the other types have 5 units each. This is clearly a response to the scale of preference, as presented in Diagram V-1. But as q was the only phonological unit at the axis of the post dorsal articulator, in the early stages of Urdu, this unit has been lost and merged with the front dorsal x in Deccani Urdu, bringing about the elimination of the post dorsal axis.

Comment 2: Whereas communication may have a more powerful impact than the other orienting principles on the paradigmatic make-up of phonological units, the impact of

physiology, acoustics, and human behavior can clearly be seen in the selective, asymmetrical utilization of these units in the formation of the syllable and the word. Thus, when we look at the frequency of occurrence of the four stop types among the monosyllabic words of Deccani Urdu, as shown in Table V-3, we find the skewings in the figures to be fully in conformity with our expectation. From the top down, in order of increasing complexity, the numbers are 868, 635, 208, 152. In fact, the most favored type alone (868) compares well in its frequency with the other three types combined (995).

Comment 3: Moving now to the right hand side of the table and reading to the left, it is noteworthy that there is a very strong favoring of the unaspirated over the aspirated stops. For the unaspirated stops (1503) outnumber by over 4 to 1 the aspirated stops (360) in their syntagmatic occurrences.

Comment 4: Among the aspirated stops alone, it may also be noted that the naturally produced voiceless aspirated stops occur more frequently (208) than the unnaturally produced voiced aspirated stops (152), despite the fact that the former are a relatively recent creation in the history of the Indo-Aryan languages.

Section E: Summary and Conclusions

In this chapter an attempt has been made to gauge the impact of some select acoustic aspects that have a bearing on

the make-up and distribution of phonological units in Deccani Urdu.

In section A, we have dealt with the acoustic base of the clearly audible *versus* the less clearly audible distinction of apertures. It is noted that the clearly audible sounds are produced, when three conditions obtain: (1) The supraglottal articulators can only shape the cavity. The medium-dorsum mass and the labia determine the volume of the cavity and size of the opening of the cavity. (2) The excitation for the two resonant cavities be provided by the glottis with the vibration of its vocal folds. (3) There should be no impediment in the flow of air coming from the lungs. These three conditions can be realized only at aperture 4 and above. The sounds produced at these apertures are traditionally known as "vowels".

The less clearly speech sounds, on the other hand are produced by impeding the air flow at apertures ∅, 1, 2, and 3, through the supraglIotal articulators. The speech sounds produced at these apertures ("stops", "fricatives", "liquids", etc.) are traditionally known as consonants.

On the basis of the clearly audible *versus* less clearly audible distinction, we have classified the 60 phonological units of Deccani Urdu into 20 vocalic and 40 consonantal units. This classification is reflected in the organization of the

phonological units, as seen in the phonological grid of Deccani Urdu.

The profound impact of the classification of the phonological units interms of audibility has also been dealt here. On the basis of audibility, we have examined the combinatory pattern of phonological units in the formation of the syllable. Thus, a theoretical basis has been provided to divide the lexical units into the monosyllabic, the bisyllabic, or the longer words, in Deccani Urdu, on the basis of the combination of keystone and flanking units.

In section B, we have described the formation of two resonant cavities within the supraglottal cavity, and examined the role that these two cavities play in the production of vocalic units of speech. The volume and the size of the opening of the front and back cavity directly affects the acoustic distinction in the production as well as perception of these units. We have also discussed here that in the production of medial vowels, a large resonance cavity is formed at the back, extending from glottis to the medium. This large cavity is more than adequate for the easy production and clear perception of the medial vowels. On the contrary, a much smaller back cavity, from the glottis to the back dorsum, is formed in the production of back dorsal vowels. This rather small back cavity does not have sufficient vertical space to amplify the acoustic distinction between back vowels. As a

result, another resonant cavity is formed in the front, extending from back dorsum to the lips, through the rounding of the labia, to solve this problem.

In section C, we have provided the acoustic rationale for the rounding of the lips in the production of back dorsal vowels. It has been discussed that the formant frequencies, obtained through spectrographic analysis, also help in distinguishing different vocalic units. For the first two formants, F1 and F2, are closely tied to the shape of the vocal tract. We have amply demonstrated that the lip rounding is essentially required to bring down the second formant F2 of the back dorsal vowels to fulfill the acoustic need for an amplified audible distinction between the "front" and the "back", as well as within the "back" vowels.

In section D, we have dealt with the acoustic justification for the four-way classification of stops and the impact of this classification on the frequency of usage of these stops in the monosyllabic words in Deccani Urdu. As a yardstick, we have set up the scale of preference for the four-stop types, and we predicted that the voiceless unaspirated stops should be most favored, the voiced unaspirated stops more favored, the voiceless aspirated stops less favored, and the voiced aspirated stops least favored. The fuller utilization of the opposing stops by forming 5 units each in the phonological paradigm is motivated by the communicative need for a

greater number of distinctive units. However, the marked skewings in the frequency of usage for the four stop types in the syntagmatic organization of the word, conforms to our expectations in terms of the degrees of preference based on the physiologico-acoustic and human behavior constraints in the production of these stops.

To conclude:

(1) The 60 phonological units of Deccani Urdu are classified into 20 vocalic and 40 consonantal units on the basis of clearly audible *versus* less clearly audible distinction.

(2) The combinatory pattern of phonological units is examined in terms of audibility (keystones and flanking units) to provide a theoritical basis to divide the lexical units, into the monosyllabic, the bisyllabic, or the longer words in Deccani Urdu.

(3) The supraglottal resonant cavity, which extends from the glottis to the lips, is divided by medium-dorsum mass into two cavities, the front and the back, each with its own resonant frequency. Each vowels is characterized by a differing combination of the two resonant frequencies, F1 and F2.

(4) In the production of medial vowels, a large resonance cavity is formed at the back, extending from the glottis to the medium, which is sufficient enough to provide acoustic distinction to the medial vowels. On the contrary, a

much smaller back cavity, from the glottis to the back dorsum, is formed which has less vertical space to provide acoustic distinction to the back dorsal vowels. This problem is solved by forming another extended front cavity, from the back dorsum to the lips, through lip rounding.

(5) The impact of the angle of the jaws is more than compensated by the rounding of the lips in the production of back dorsal vowels.

(6) The four-way classification of stops in Deccani Urdu is mainly based on the communicative principle of contrast. However, the four-way distinction of these stops is primarily established in terms of acoustic principle. For only with the full understanding of the glottal dynamics, can we distinguish the four stop types from one another.

(7) In terms of the scale of preference for the four stop types, we predict that the voiceless unaspirated stops should be most favored, the voiced unaspirated stops more favored, the voiceless aspirated stops less favored, and the voiced aspirated stops least favored.

(8) The fuller utilization of the four-way opposition of stops by forming 5 units each, in the phonological paradigm of Deccani Urdu caters to the communicative need for a greater number of distinctive units.

(9) The marked skewings in the frequency of usage for the four stop types in the syntagmatic organization of the

word, responds to the degrees of preference based on the physiologico-acoustic and human behavior constraints in the production of these stops.

CHAPTER VI
INTERACTION OF THE ORIENTING PRINCIPLES IN THE PHONOLOGY OF DECCANI URDU: SUMMARY AND CONCLUSIONS

CHAPTER VI

INTERACTION OF THE ORIENTING PRINCIPLES IN THE PHONOLOGY OF DECCANI URDU: SUMMARY AND CONCLUSIONS

The phonological analysis of Hyderabad dialect of Deccani Urdu has been carried out in this thesis with a view to showing the role of qunituple orientations--physiological mechanism, human behavior, communication, vision, and acoustic medium--as the motivating principles for departures from random arragement of phonological units in both their paradigmatic make-up and sytagmatic distribution. In this chapter, we present the result of our analysis in three sections. In section A, we deal with select phonological skewings that are brought forth by the interaction of two or more orientations. Section B contains a breif chapterwise summary of the phonological analysis. In section C, we present conclusions with a comment on the worth of our analysis.

Section A: The Interaction of the Orientations

As discussed earlier, orienting principles themselves provide a motivated rationale for the skewings encountered in the paradigmatic make-up and syntagmatic distribution of the phonological units. These skewings have been dealt with in separate chapters, each devoted to one of the qunituple

orientations. Further, we have also examined in these chapters that how a particular skewing, which is explained in terms of one orienting principle, is often favored or disfavored by other orientating principles. In this section, we make an attempt to highlight that how the interactin of different orientations produces phonological skewings in Deccani Urdu.

It is noteworthy that although there are quite a few phonological skewings which are favored and disfavored in terms of more than one orientations, we discuss only some select phonological skewings here with the help of Table VI-1.

Stop Types	Labial		Apical		Dorsal		Medial		Total	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
Voice-less Unasp-irated	121	65	104	225	92	111	68	73	385	474
	36.56	57.02	34.78	66.37	39.66	54.15	33.33	57.93	36.12	60.46
	186		329		203		141		859	
	41.8		51.57		46.46		42.73		46.43	
Voiced Unasp-irated	127	48	108	96	68	77	66	41	369	262
	38.37	42.1	36.12	28.32	29.31	37.56	32.35	32.54	34.62	33.42
	175		204		145		107		631	
	39.33		31.97		33.18		32.42		34.11	
Voice-less Aspir-ated	43	0	39	16	40	17	45	8	167	41
	12.99	0	13.04	4.72	17.24	8.29	22.07	6.35	15.67	5.23
	43		55		57		53		208	
	9.66		8.62		13.04		16.06		11.24	
Voiced Aspir-ated	40	1	48	2	32	0	25	4	145	7
	12.08	.88	16.06	.59	13.79	0	12.25	3.18	13.6	.89
	41		50		32		29		152	
	9.21		7.84		7.32		8.79		8.22	
Total	331	114	299	339	232	205	204	126	1066	784
	100	100	100	100	100	100	100	100	100	100
	445		638		437		330		1850	
	100		100		100		100		100	

Table VI-1:Interaction of Orientations in the Distribution of Stops in the Monosyllabic Words

Comments on Table VI-1

Comment 1: Interaction of the Orientations: Physiological Mechanism Acoustic Medium and Human Behavior.

As seen in the last column for the monosyllabic words in the table above, of the 1850 occurrences of the four stop

types combined, the simplest, voiceless unaspirated stops have 859 occurrences, followed by the least complex, voiced unaspirated stops 631 occurrences, the more complex, voiceless aspirated stops 208 occurrences, and the most complex, voiced aspirated stops 145 occurrences. That is, in order of increasing complexity, the actual occurrences of the four stop types, show a downward trend. This selective asymmetrical utilization of the four stop types in the formation of the syllables and words in Deccani Urdu is clearly motivated by the interaction of physiology, acoustics, and human behavior. For, it is through the acoustical study that we are able to gauge the phsiological complexity of the four stop types. Further, on the basis of their graded physiologico-acoustic complexity, a hierarchy among the four stop types is established. (Cf. Chapter V, section D.) And as we have discussed earlier in our chapter on human behavior that the simpler, less complex phonological units are preferred over more complex units in a language.

Comment 2: Interaction of the Orientations:

Communication and Human Behavior

As seen in the last column for the monosyllabic words in the table above, of the 1066 initial occurrences, the simplest voiceless unaspirated stops have 385 occurrences, followed by the voiced unaspirated stops 369 occurrences, the voiceless aspirated stops 167 occurrences, and the most

complex, voiced aspirated stops 145 occurrences. As these figures indicate, the scale of preference for the four stop types is maintained throughout. Further, these stops are more or less competitively utilized in this communicatively important word initial position due to the powerful impact of communication.

On the other hand, of the 784 final occurrences of the stops in the monosyllabic words, the voiceless unaspirated stops have 474 occurrences, followed by the voiced unaspirated stops 262 occurrences, the voiceless aspirated stops 41 occurrences, and the voiced aspirated stops 7 occurrences. That is, the simplest, voiceless unaspirated stops are additionally favored and the most complex, voiced aspirated stops are additionally disfavored in this communicatively least important word final position. This sharp skewing in favor of the favored voiceless unaspirated stops and against the disfavored voiced aspirated stops in this position is brought forth by the interaction of human preference for simpler phonological units, and lesser communicative impact at the end of the word.

Comment 3: Interaction of the Orientations:

Vision and Communication

As seen in the column for labial stops in the table above, of the 445 labial occurrences in the monosyllabic words, 331 stops appear in communicatively important initial

position of the word, whereas only 114 stops appear in communicatively least important final position of the word. That is, the initial labial stops appear in a ratio of almost 3 to 1 the final labial stops. This extraordinary skewing in favor of the word initial labials is brought about jointly by the visibility factor of the labial articular and greater communicative load. However, the extraordinary disfavoring for the labial stops in the word final position is attributed to the joint interaction of the minimum communicative load the the inverse impact of the visibility of the labial articulator.

Section B: Summary

In the Introduction, we have dealt with the historical setting of Hyderabad Urdu, the field procedures utilized in the collection and analysis of the data, the theoritical principles that motivate the phonological analaysis, and the scope of the study in section A, B, C and D, respectively.

In Chapter I, we have made an effort to breifly present the phyciological base of Deccani Urdu phonology in terms of the orienting principle of physiological mechanism of Columbia school of linguistics. Here an attempt has been made to provide justification for the phonological skewings that are encountered in the paradigmatic make-up and the syntagmatic distribution of the word in Deccani Urdu, in terms of the physiological parameters of articulators and apertures.

In section A, we have presented the phonological grid of Deccani Urdu (Diagram I-1), followed by explanatory comments dealing with the different aspects of the grid. Although the phonological units in the grid have primarliy established by contrast through minimal and subminimal pairs in terms of the orienting principle of communication, these phonological units have ben appropriately placed on the intersections of the relevant axes of articulators and apertures on the basis of their substantive characteristics in terms of the physiology of the vocal tract.

We have established 9 degrees of aperture, and 8 articulators for the placement of phonological units in the grid of Deccani Urdu. The degrees of aperture are subjected to two braod divisions, namely, the constriction *versus* opening, and the clearly audible *versus* less clearly audible. The former is primarily based on physiological mechanism whereas the latter division is mainly based on acoustic medium.

The articulators that are particularly relevant to the production of phonological units in Deccani Urdu, are the labia, the apex, the medium, the front dorsum, the back dorsum, the velum, and the glottis.

On the intersections of relevant articulators and apertures, we have established 60 phonological units. Of these 60 phonological units, 56 are fulfledged "phonemes". The other 4 units are non-distinctive positional variants that

appropriately fill some empty intersections on the phonological grid, and have therefore been raised to the status of phonological units. Further, three highly abstract units of V(oicing), A(spiration), and N(asality) have also been placed on the phonological grid. For these three units are superimposed on other, simpler phonological units to produce more complex units, such as, voiced stops, voiceless aspirated stops, nasal vowel etc., in Deccani Urdu.

In section B, we have evaluated the impact of the hierarchy of adroitness of articulators on the paradigmatic make-up of the consonantal units and their frequency of occurrence in the monosyllabic words in Deccani Urdu. We have set up a scale of adrotiness for the articulators, with the apex as the most adroit, the dorsum (and the labium) as more adroit, the medium as less adroit, and the post dorsum as the least adroit. In accordance with this scale relationship, we predicted that the apical consonants should be most favored both in the number of units and in their frequency of usage in the word, followed by the dorsal or labial consonants, the medial consonants, and the post dorsal consonants in that order. And it has been amply demonstrated through the actual frequency counts that the paradigmatic and the syntagmatic distribution of phonological units of Deccani Urdu fully conforms to our expectations.

In section C, we have dealt with the medium-dorsum mass as the articulator for vowels. It has been argued that the structure and the shape of the medium-dorsum mass is ideally suited for the formation of the resonant cavities, a necessary requirement for the production of vocalic units of speech in a language. It has been shown through a diagram, that the three articulators, namely, the medium the front dorsum, and the back dorsum, in association with the clearly audible apertures 4 through 9, produce 20 vocalic units in Deccani Urdu.

Of the 20 vocalic units in Deccani Urdu, 8 are produced by medium, 8 by back dorsum, and 4 by front dorsum. It has been noted that notwithstanding the asymmetry of the vocal tract, we encounter a parity in the number of units for the back dorsal vowels *vis-a-vis* the medial vowels. In defense of this parity, it has been argued that as all the back dorsal vowels are labio-dorsal ("back rounded"), the impact of the angle of the jaw with its vertex at the back, is more than compensated by utilizing the labia as an additional articulator in the production of these vowels in Deccani Urdu.

Further, it has been noted that there is only a two-way horizontal opposition between the medial and the back dorsal vowels in Deccani Urdu. For, as the opposing medial and back dorsal vowels are formed at the fringes of the horizontal axes, there is maximum horizontal space available to the opposing units due to the absence of front dorsal vowels in between

them on their own apertures, which facilitates a relatively easy production and clear perception of these vowels. It is argued that this factor also contributes to the parity of the two types of vowels in Deccani Urdu.

However, it has also been noted that the four-way opposition at the medial and back dorsal axes does create vertical crowding of the vocalic units, and it requires precision of control on the part of the speaker to maintain the acoustic distinction between the opposing units. In conformity with the human trait to disfavor relatively more complex phonological units, it has been established through frequency counts that in comparison with the front dorsal vowels, the medial and the back dorsal vowels are less frequently utilized in the organization of the word in Deccani Urdu.

Finally it has been noted that there is an asymmetry in the number of units for the long (14) in comparison with the short vowels (6) in the vocalic paradigm of Deccani Urdu. It has been argued that this discrepancy in the number of vocalic units is brought forth by the quantitative distinction of the duration itself. The greater duration of the long vowels greatly facilitates their proper production and clear perception by the native speakers. On the contrary, the momentary phase of the short vowels becomes a hindrance in the exact articulation and clear perception of these vowels. In consequence, Deccani Urdu has a rich, 7-vowel system for the

long vowels, for both the oral vowels and the nasal vowels. At the same time, the problems of articulation and perception associated with the short vowels, are satisfactorily resolved in Deccani Urdu by forming a 3-vowel system.

In Chapter II, on attempt has been made to examine the paradigmatic make-up and syntagmatic distribution of the phonological units in terms of human behavior orientation.

In section a, we have dealt with three main dichotomies amon the ponological units of Deccani Urdu that are motivated by the human trait of preferring fewer articualtors over more articulators. The dichotomies, voiced *versus* voiceless consonants, aspirated *versus* unaspirated among the voiceless stops, and nasal *versus* oral vowels, are characterized by the use of an extra articulator. In view of the preference for fewer articulator, we predicted that the voiceless consonants should be preferred over the voiced consonants, the unaspirated over the aspirated among the voiceless stops, and the oral vowels over nasal vowels in Deccani Urdu. It has been successfully demonstrated through the actual frequency counts that the phonological skewings, as observed in Deccani Urdu, are clearly in conformity with our expectations in terms of fewer *versus* more articulators.

In section B, we have examined the relation between the apcio-dental ("dental") consonants and the apico-palatal ("retroflex") consonants in terms of the human trait of proximte

versus remote place of articulation. Here we predicated that the apico-dental consonants, produced with proximate place of articulation should be preferred over apico-palatal consonants, produced with remote place of articulation. For it is easier for the apex as an articulator to come in contact with the adjacent place of articulation (the teeth), *vis-a-vis* the remote place of articulation (the palate). It has been successfully demonstrated through the actual counts that the apico-dental consonants have a preference over apico-palatal consonants, both in the number of units in the paradigm as well as in the frequency of usage in the word in Deccani Urdu.

In section C, we have studied the combinatory aspect of Deccani Urdu phonology through the assimilative trait of neighboring phonological units. In view of the general avoidance of fine, precisely coordinated movement of articulator, we predicted that there should be a favoring for the combination of phonological units that become similar due to the impact of assimilation. The skewed occurrences in favor of the favored and against the disfavored combinations, fully conforms to our expectations in terms of the assimilative trait of neighboring phonological units.

In section D, we have evaluated the impact of degree of aperture change on the combinatory pattern of Deccani Urdu. It has been argued that large changes of aperture which require less precision of control are preferred over small

changes of aperture which require greater precision of control. It is therefore demonstrated through the potential and the actual occurrences of the three types of monosyllabic (CVC, CVCC, CCVC) words of Deccani Urdu that the CVC type which involve larger changes of aperture are drastically favored.

In section E, we have exmained how human behavior orienation provides reinforcement to the validity of the phonological units in the grid. The phonological skewings in the grid have been explained in view of the human preference for the phydiologico-acoustically simpler, less complex phonological units.

In chapter III, we have dealt with the orienting principle of communication to provide justification for the paradigmatic and syntagmatic skewings observed in the phonology of Deccani Urdu.

In section A, we have provided communicative justification for 56 of the 60 phonological units, as presented in the phonological grid of Deccani Urdu. These 56 elemental units of communication ("phonemes") are established by way of contrast through minimal and subminimal pairs.

In section B, we have examined the combinatory pattern of the phonological units with a view to highlighting the role of communication in Deccani Urdu phonology. Here it is discussed that the consonantal interchange in the initial and final positions in the CVC type of monosyllabic words brings

about a change in meaning in Deccani Urdu. And it is through the change in the combinatory pattern of the some phonological units that a different word is created in this dialect.

It has been argued that the beginning of the word carries greater communicative load than the end of the word. Thus, in view of the differing communicative load associated with the initial and final positions of the word, we encounter a skewing in the distribution of phonological units in th two positions. It has been shown through the frequency counts that all the four types of consonants (apical, dorsal, labial, and medial) compete well in the communicatively important word initial position. However, the apical consonants, produced by the most adroit apex, are drastically favored *vis-a-vis* the non-apical consonants in the communicatively less important word final position. This discrepancy in the usage of consonants in the initial and final positions is brought about by the communicative factor.

In section C, we have taken up the phonological merger of consonantal units of Deccani Urdu. It is argued that the phonological units that are characterized with a low communicative load, are merged with the neighboring phonological units.

In section D, we deal with homonymy as a communicative problem. It is argued that langauges avoide

phonological mergers for they create a large scale homonymy. Here we have shown that despite the word final deaspiration in Deccani Urdu, we encounter only a few pairs of homonymous words. In addition , only one pair of homonymous words are created as a result of the merger of post-dorsal stop in Deccani Urdu.

In Chapter IV, an attempt has been made to evaluate the impact of vision as on orienting principle on the phonology of Deccani Urdu. We have provided a motivated rationale in terms of vision for the phonological skewings observed in word initial and word final positions, in favor of or against the labial *versus* non-labial consonants as they appear in the monosyllabic words in Deccani Urdu.

In section A, we have compared the frequency of occurrence for the labial consonants with that of apical, dorsal, and medial consonants, in both the intial and the final position of the monosyllabic words in Deccani Urdu. In section A1, the frequencies of the labial *versus* the non-labial among the stops have been comapred with a view to evaluating the role of vision in the distribution of consonantal units in the initial and final positions of the monosyllabic words in general, and of the CVC words in particular.

The frequency counts clearly indicate that the labial stops are usually most favored in the communicatively important word initial position, and are usually least favored in

the communicatively insignificant word final position. It is argued that this unusual skewing in the distribution of the stops in Deccani Urdu is motivated by vision as on orienting principle.

In section A2, we have assessed the impact of vision on the frequency of occurrence of the labial *versus* non-labial among the nasal consonants in the initial and final positions of the monosyllabic words in general, and of the CVC words in particular.

As the frequency counts clearly demonstrate, the labial m becomes the most favored nasal consonant in word initial position, whereas the apical n becomes the most favored nasal consonant in word final position. Again, we argue that this unusual skewing for the labial m in the two positions of the word, is brought about by vision.

In Chapter V, we have made an effort to gauge the impact of some select acoustic aspects that have a bearing on the make-up and distribution of phonological units in Deccani Urdu.

In section A, we have dealt with th acoustic base of the clearly audible *versus* the less clearly audible distinction of apertures. On the basis of audibility, we have classified 60 phonological units of Deccani Urdu into 20 vocalic units and 40 consonantal units. This classification is reflected in the

organization of the phonological units, as seen in the phonological grid of Deccani Urdu.

It has been noted that the audibility provides the theoritical basis to divide the lexical units into the monosyllabic, the bisyllabic, or the longer words on the basis of the combination of keystone and flanking units.

In section B, we have dealt with how two resonant cavities are formed within the supraglottal cavity and evaluated the role that these two cavities play in the production of vowels in a language.

In section C, we have provided the acoustic rationale for the rounding of the lips in the production of back dorsal vowels.

In section D, we have provided acoustic justification for the four-way classification of stops, and tried to gauge the impact of this classification on the frequency of usage of these stops types in the monosyllabic words in Deccani Urdu. As a yardstick, we have set up the scale of preference for the four stop types, and we predicted that the voiceless unaspirated stops should be most favored, the voiced unaspirated stops more favored, the voiceless aspirated stops less favored, and the voiced aspirated stops least favored. The fuller utilization of the opposing stops by forming 5 units each in the phonological paradigm is motivated by the communicative need for a greater number of distinctive units.

However, the marked skewings in the frequency of usage for the four stop types in the syntagmatic organization of the word, conforms to our expectations in terms of the degrees of preference based on the phydiologico-acoustic and human behavior constraints in the production of these stops.

Section C: Conclusions

We may conclude with the following observations:

(1) A total of 60 phonological units (40 consonantal and 20 vocalic) have been set up for Deccani Urdu of Hyderabad, as presented in the phonological grid (Diagram I-1).

(2) The phonological grid of Deccani Urdu though looks similar, is basically different from the "phonemic inventory" of the traditional American phonemicists. In Columbia school phonology and American descriptive phonemics, the basic phonological units (or the "phonemes") of a language are established by contrast through minimal and subminimal pairs. However, as this procedure involves the recognition of meaning, the descriptive phonemicists use it as a short-cut for discovering the "phonemes". For they insist that the "phonemes" must formally be established thorugh distributional-substitutional criteria. In Columbia school phonology, it is perfectly all right to make full use of meaning for the identification of phonological units. For the phonological unit (the "phonemes") is recognized as an

elemental unit of communication, and communication is an important orienting principle for phonological analysis.

(3) Unlike "phonemic inventory" , the phonological grid is not just a mere listing of the phonological units. For the phonological grid highlights the value relationship of these units. Further, the phonetic substance of the phonological units in the grid is determined by the physiological parameters of articualtors and apertures. Therefore, both phonetic substance and phonological value are weighed on equal scales in the present phonological analysis.

(4) An important theoritical difference between Columbia school phonology and American descriptive phonemics is that, in traditional phonemics, the physiological classification of speech sounds is treated as a non-linguistic level under articulatory phonetics. But in the present analysis, physiological mechanism is a problem solving device (an orienting principle) that provides a motivated rationale for the particular susbtantive make-up of the phonological units and the interrelationships of these units in the organization of the phonological grid and in the formation of morphemes and words in Deccani Urdu, as in any other language.

(5) The phonological analysis presented here, departs radically from the traditional analysis in that here we provide an explanation of the non-random distribution of phonological units in both their paradigmatic interrelationship in the grid

and their combinatory characteristics in the syntagm, in terms of independently known and verifiable principles of physiological mechanism, communication, human behavior, vision, and acoustic medium.

(6) The thesis contains both theoretical and methodological innovations in the study of Deccani Urdu phonology. The analysis presented in this thesis abandons description in favor of explanation, and provides quantitative procedures for the attestation of the hypothesis. The result of the present study support our claim that phonology is not random but motivated.

The evidence that we have presented for the establishment of the phonological grid of Deccani Urdu with 60 phonological units, and for their non-random distribution in the various positions of the words in terms of the phonological principles of Columbia school of linguistics, seems to prove the validity of our analysis beyond doubt. This thesis may not only explain the inner mechanism of the Deccani Urdu phonology, but may also contribute to our understanding of the phonological theory that presents new procedures for the validity of phonological units, and their particular distributional patterns.

APPNEDIX A
BIBLIOGRAPHY

BIBLIOGRAPHY

Aaronson, Doris and Robert W. Rieber, eds.

1979 Psycholinguistic Research: Implications and Applications. New York, Halsted Press, John Wiley and Sons.

Abercrombie, David

1967 Elements of General Phonetics. Edinburgh, Edinburgh University Press.

Ahmed, Md. Rehan

1995 Phonology of Monosyllabic Words in Calcutta Urdu: A Communicative Approach. Aligarh Muslim University M.Phil. dissertation (Unpublished).

Ali, S. Ekhteyar

1996 Phonology of Monosyllabic Words in Hyderabad Urdu: A Communicative Approach. Aligarh Muslim University M.Phil. dissertation (Unpublished).

Allen, W. Sidney

1961 Phonetics in Ancient India. London, Oxford University Press.

Arfi, Ameer

1972 Dakni Farhang: Chhe Aham Masnaviyon Ki Farhang. Hyderabad, Adabi Akademi, Asif Nagar.

Azim, Abdul

1978 Systems of the Verb in Classical Urdu. Ph.D. dissertation, Columbia University. Ann Arbor, Michigan, University Microfilms International.

1989 The Phonology of Monosyllabic Words in Urdu and Hindi. Paper presented at the International Seminar: The Common Bases of Urdu and Hindi, held at the Aligarh Muslim University, Aligarh, India.

1989 Some Problems in the Phonology of Modern Standard Urdu. Paper presented at the First International Conference of the Columbia School of Linguistics, held at Columbia University, New York City.

1992 Phonological and Communicative Asymmetry in Modern Standard Urdu. Paper presented at the International Seminar: Role of Communication in Linguistic Theory, held at the Aligarh Muslim University, Aligarh, India.

1993 Problems of Aspiration in Modern Standard Urdu. Paper presented at the Third International Conference of the Columbia School of Linguistics, held at Rutgers University, New Brunswick, NJ.

1997 The Phonology of the Vocalic Systems of Modern Standard Urdu. Paper presented at the Fifth International Conference of the Columbia School of Linguistics, held at Rutgers University, New Brunswick, NJ.

Bailey, T. Grahame

1932 A History of Urdu Literature. Calcutta, Association Press, YMCA.

Beams, John

1966 Comparative Grammar of the Modern Aryan Languages of India to wit Hindi, Punjabi, Gujrati, Marathi, Orya, and Bengali. Delhi, Munshiram Manoharlal, Reprint.

Bloch, Bernard and George L. Trager

1942 Outline of Linguistic Analysis. Baltimore, Linguistic Society of America.

Bloomfield, Leonard

1933 Language. New York, Henry Holt and Company.

Contini-Morava, Ellen and Barbara Sussman Goldberg, eds.

1995 *Meaning as Explanation: Advances in Linguistic Sign Theory. (Trends in Linguistics: Studies and Monographs 84.)* Berlin, Mouton de Gruyter.

Davis, Joseph

1987 A Combinatory Phonology of Italian. Part I: Initial Constriction to Maximal Aperture. New York, Columbia University Working Papers in Linguistics (CUWPL), Vol. 8, pp. 1-99.

Denes, Peter B. and Elliot N. Pinson

1964 The Speech Chain: The Physics and Biology of Spoken Language. Baltimore (Maryland), Bell Telephone Laboratories.

Diver, William

1974 Substance and Value in Linguistic Analysis. Semiotext(e), Vol. 1, pp. 11-30.

1975 Introduction. New York, CUWPL, Vol. 2, pp. 1-26.

1979 Phonology as Human Behavior, in: Doris Aaronson and Robert W. Rieber, eds.

1982 Introduction. New York, CUWPL, Vol. 7, pp. 1-12.

1990 Theory. (Paper presented at the First International Conference of the Columbia School of Linguistics, held at Columbia University, New York City).

1992 The Communicative Motivation for the Centum-Satem Split. Paper presented at the International Seminar: The Role of Communication in Linguistic Theory, held at the Aligarh Muslim University, Aligarh, India.

1995 "Theory", in: Ellen Contini-Morava and Barbara Sussman Goldberg, eds., pp. 43-114.

Emeneau, M.B.

1958 Sanskrit Sandhi and Exercises. Berkeley, University of California Press.

Fatihi, A.R.

1987 Economy of Articulation in Mewati Phonology. Aligarh Muslim University Ph.D. thesis (Unpublished).

Firth, J.R.

1957 Papers in Linguistics (1934-1951). London, Oxford University Press.

Garcia, Erica

1975 The Role of Theory in Linguistic Analysis: The Spanish Pronoun System. Amsterdam, North Holland.

1977 On the Practical Consequences of Theoretical Principles. Lingua, Vol. 43, pp. 129-169.

Gribble, J.D.B.

1869 A History of the Deccan. London, Luzac and Co.

Grierson, George A.

1916 Linguistic Survey of India. Vol. IX: Indo-Aryan Family, Central Group. Part I: Western Hindi and Punjabi. Delhi, Motilal Banarsidass, Reprint 1967-

1968.

Gumperz, John J. and C.M. Naim

1960 Formal and Informal Standards in Hindi Regional Language Area. IJAL, Vol. 26, Number 3, Part II (Charles A. Ferguson and John J. Gumperz: *Linguistic Diversity in South Asia*).

Hameed, Shabana

1995 Testing the Principles of an Explanatory Phonology: The Case of Lucknow Urdu. Aligarh Muslim University Ph.D. thesis (Unpublished).

Harris, Zellig S.

1951 Methods in Structural Linguistics. Chicago, The University of Chicago Press.

Heffner, R. M. S.

1960 General Phonetics. Madison, The University of Wisconsin Press.

Jabeen, Shazi Shah

1993 Economy of Articulation in the Phonology of Bihar Urdu (As Spoken in and Around Gaya). Aligarh Muslim University Ph.D. thesis (Unpublished).

Jakobson, Roman, C. Gunnar M. Fant and Morris Halle

1967 Preliminaries to Speech Analysis: The Distinctive Features and their Correlates. Cambridge (Massachusetts), The MIT Press.

Joos, Martin, ed.

1958 Readings in Linguistics: The Development of Descriptive Linguistics in America since 1925. New York, American Council of Learned Societies.

Kelker, A.R.

1968 Studies in Hindi-Urdu: I-Introduction and Word Phonology. Poona, Deccan College.

Khan, Israr

1990 Statistical Study of Hindi Speech Sounds. Aligarh Muslim University Ph.D. thesis in Physics (Unpublished).

Khan, Masud Husain

195? Phonetic and Phonological Study of the Word in Urdu. Aligarh, AMU, Department of Urdu, Studies No. 1.

1966 Muqaddama-e-Sher-o-Zaban. Hyderabad, Osmania University.

1969 Urdu Zaban aur Adab. Aligarh, Educational Book House.

1988 Muqaddama-e-Tarikh-e-Zaban-e-Urdu. Aligarh, Educational Book House.

Khan, Masud Husain and Ghulam Omer Khan, eds.

1979 Classical Dakani Urdu Dictionary. Hyderabad, Andhra Pradesh Sahitya Akademi.

Khan, Naseer Ahmad

1979 Urdu ki Bolian aur Karkhandari ka Imrani Lisaniyati Mutalia. New Delhi, Idara-e-Tasnif.

Khan, Raza Ali, ed.

1991 Hyderabad Four Hundred Years 1591-1991. Hyderabad, Zenith Services, Masab Tank.

Kirsner, Robert S.

1976 The Theory, New York, CUWPL, Vol. 4, pp. 21-58.

Ladefoged, Peter

1962 Elements of Acoustic Phonetics. Chicago, The University of Chicago Press.

Lisker, Leigh and Arthur S. Abramson

1964 A Cross-Language Study of Voicing in Initial Stops: Acoustical Measurements. Word, Vol. 20, pp. 384-422.

Martinet, André

1955 Économie Des Changements Phonétiques: Traité De Phonologie Diachronique. Berne, S.A. Editions A. Francke.

1964 Elements of General Linguistics. (Translated from French by Elizabeth Palmer). London, Faber and Faber Ltd.

Mustafa, Khateeb S.

1985 Descriptive Study of Dakhni Urdu as Spoken in the

Chittoor District, A.P. Aligarh Muslim University Ph.D. thesis (Unpublished).

Otheguy, Ricardo and Erica Garcia

1977 Explaining Dialect Variation: A Test for Linguistic Theory. Paper read at the Twelfth International Linguistic Conference, Vienna, Austria.

Platts, John T.

1941 A Grammar of the Hindustani or Urdu Language. London, Oxford University Press.

1965 A Dictionary of Urdu, Classical Hindi and English. London, Oxford University Press.

Qadri, S.G. Mohiuddin

1930 Hindustani Phonetics. Hyderabad, Maktabah-e-Ibrahimiah.

Rauf, Zia

1994 Testing the Principles of an Explanatory Phonology: The Case of Delhi Urdu (As spoken in the Vicinity of Jama Masjid). Aligarh Muslim University Ph.D. thesis (Unpublished).

1997 Phonology of Delhi Urdu. Delhi, Shipra Publications.

Reid, Wallis

1974 The Saussurian *Signe* as a Control in Linguistic Analysis. Semiotext(e), Vol. 1, pp. 31-53.

Sadiq, Muhammad

1964 A History of Urdu Literature. London, Oxford University Press.

Samarin, William J.

1967 Field Linguistics: A Guide to Linguistic Field Work. New York, Holt, Rinehart and Winston.

Saussure, Ferdinand de

1959 A Course in General Linguistics. (Edited by Charles Bally and Albert Sechehaye; Translated from the French by Wade Baskin). New York, Philosophical Library.

Schmidt, Ruth Laila

1981 Dakhini Urdu: History and Structure. New Delhi, Bahri Publications.

Sherwani, Haroon Khan

1971 Deccani Culture. Delhi, Jamal Press.

Singh, Bahadur

1966 The Dialect of Delhi. New Delhi, South Asia Institute, University of Heidelberg.

Singh, Kirpa Shankar

1978 Readings in Hindi-Urdu Linguistics. New Delhi, National Publishing House.

Surti, Samina A.A.

1989 Interaction of Physiology and Psychology in the

Phonology of Bhopal Urdu. Aligarh Muslim University Ph.D. thesis (Unpublished).

Trubetzkoy, N.S.

1969 Principles of Phonology. (Translated by Christiana A.M. Baltaxe). Berkeley, University of California Press.

Turner, Ralph Lilley

1966 A Comparative Dictionary of the Indo-Aryan Languages. London, Oxford University Press.

APPNEDIX B
GLOSSARY OF THE MONOSYLLABIC WORDS IN DECCANI URDU

GLOSSARY OF THE MONOSYLLABIC WORDS IN DECCANI URDU

The glossary presented below includes all the monosyllabic words of Deccani Urdu. The informants selected for the collection of these words spoke Urdu as their mother tongue.

As a rule, this glossary includes only those monosyllabic words which occur as free forms in Deccani Urdu. However, inflected forms of postpositions and verbal auxiliaries have also been listed as separate items in the glossary.

Each item of the glossary is presented in five columns. The first column contains the serial number of the entries. In the second column, we transcribe the entries in terms of the phonological units of Deccani Urdu, as established in Diagram I-1. Thus, some words having the same meaning, but differing slightly in their phonological make-up, have been listed as separate entries. To be sure, cross references have been provided for such entries. The third column identifies the form class to which each entry of the glossary belongs.

In the fourth column, we present each entry in the Urdu orthography. Whereas each orthographic entry represents the equivalent of its spoken counterpart presented in the second column, any deviation from Standard Urdu is being shown by giving Standard Urdu version in parentheses. The fifth column provides the gloss for all the entries in English.

The alphabetic order of the entries in the glossary is as follows:

Vowels:

A I U

A^n I^n U^n

a: i: u: e: o: ɛ: ɔ:

$a:^n$ $i:^n$ $u:^n$ $e:^n$ $o:^n$ $ɛ:^n$ $ɔ:^n$

Consonants:

p p^h b b^h t t^h d d^h T T^h D D^h

c c^h j j^h k k^h g g^h

m n N ñ ŋ

f v s z ʃ x ɣ h

w l L r R R^h y

The abbreviations used in the glossary are presented below:

N	Noun
N_m	Noun masculine
N_f	Noun feminine
Pron	Pronoun
Rel Pron	Relative Pronoun
Demon Pron	Demonstrative Pronoun
Pers Pron	Personal Pronoun
Refl Pron	Reflexive Pronoun
Recip Pron	Reciprocal Pronoun

Adj	Adjective
Pred Adj	Predicate Adjective
V	Verb
V_i	Verb intransitive
V_t	Verb transitive
Aux	Auxiliary
Pres Aux	Present Auxiliary
Past Aux	Past Auxiliary
Fut Aux	Future Auxiliary
Adv	Adverb
Neg Adv	Negative Verb
Prep	Preposition
Postp	Postposition
Conj	Conjuction
Intrj	Interjection
Pcl	Particle
Emp Pcl	Emphatic Particle
Encl Pcl	Enclitic Particle
obl	oblique
sg	singular
pl	plural
masc	masculine
fem	feminine
prox	proximate

Serial No.	Entries	Form Classes	Urdu Orthography	Gloss
1.	Ap	Refl Pron	اپ	oneself
2.	Ab	Adv	اب	now, presently
3.	At	Adj	ات	very much
4.	Ad (cf. a:d)	Adj	اد	half
5.	AT	V_i	اٹ	be filled
6.	Aks	N_m	اکس (عکس)	reflection; shadow; image
7.	Arz	N_m/N_f	ارز (عرض)	width, breadth; request
8.	Arʃ	N_m	ارش (عرش)	heaven; throne, throne of God
9.	Arx	N_m	ارخ (عرق)	juice; extract
10.	AR	V_i	اڑ	be obstinate
11.	Is (cf. ye:)	Demon Pron	اس	this; him, her, it (prox); obl. sg.
12.	Iʃ x	N_m	اشخ (عشق)	love
13.	Irs	N_m	عرس	spouse: husband, wife
14.	UT (cf. UT^h)	V_i	اٹ(اٹھ)	get up; stand up
15.	UT^h (cf. UT)	V_i	اٹھ	get up; stand up
16.	Uc	Adj	اچ	high, lofty
17.	Ug	V_i	اگ	germinate, grow
18.	Uf	Intrj	اف	oh!, alas!
19.	Us	Demon Pron	اس	that; him, her, it (remote); obl. sg.
20.	Urs	N_m	عرس	a religious ceremony celebrating the union of the soul of a deceased pir or saint with the Supreme Spirit (the

				saint's deciples gather round his grave, and read the fatiha, and offer food, incense, lights etc.)
√21.	UR	V_i	اڑ	fly
22.	A^nŋ (cf. A^nŋg)	N_m	انگ	limb; body
23.	A^nŋg (cf.A^nŋ)	N_m	انگ	limb; body
24.	I^nn (cf. ye:)	Demon Pron	ان	these; them (prox.); him, her (polite); obl. pl.
25.	Iñc	N_m	انچ	inch
26.	U^nmr f~U^nmAr	N_f	امر(عمر)	age
27.	U^nn (cf. wo:)	Demon Pron	ان	those; them (remote); him, her (polite); obl. pl.
28.	U^nns	N_m	انس	attachment, affection
29.	a:	N_f	آ(آہ)	sigh
30.	a:	V_i	آ	come
31.	a:p	Pron	آپ	you (polite)
32.	a:b	N_m/N_f	آب	water; sharpness luster
33.	a:t	Adj	آت	infinite
34.	a:d (cf. Ad)	Adj	آد(آدھ)	half
35.	a:T	Pred Adj	آٹ	close; stop
36.	a:T (cf. a:T^h)	Adj	آٹ	eight
37.	a:T^h (cf.a:T)	Adj	آٹھ	eight
38.	a:j	Adv	آج	today
39.	a:g	N_f	آگ	fire

40.	a:s	N_f	آس	hope
41.	a:l	N_f	آل	off-spring
42.	a:l	N_f	آل	scallion
43.	a:r	N_f	آر (عار)	disgrace; modesty
44.	a:R	N_f	آڑ	barrier
45.	a:R	N_f	آڑ	screen, shelter, protection.
46.	i:d	N_f	اید (عید)	Eid: a muslim festival
47.	u:b	V_t	اوب	be fed up
48.	u:T (cf. u:^{n}T)	N_m	اوٹ (اونٹ)	camel
49.	e: (cf.ɛ:)	Intrj	اے	hey!
50.	e:k	Adj	ایک	one
51.	o:	Intrj	او (اوہ)	oh! alas!
52.	o:T	N_m	اوٹ (ووٹ)	vote
53.	o:T	N_m	اوٹ	veil; partition, screen
54.	o:s	N_f	اوس	dew
55.	o:l	N_m	اول	esculent root;
56.	o:r	N_m	اور	side
57.	o:R (cf. o:R^h)	V_t	اوڑ	cover with
58.	o:R^h (cf. o:R)	V_t	اوڑھ	cover with
59.	ɛ: (cf. e:)	Intrj	اے	hey!
60.	ɛ:b	N_m	ایب (عیب)	defect, fault
61.	ɛ:ʃ	N_f	ایش (عیش)	pleasure, luxury, enjoyment
62.	ɛ:l	Adj	ایل (اہل)	able, capable, fit,
63.	ɔ:r	Adj; Adv; Conj	اور	other, another; more; and

64.	a:^{n}b	N_m	آنب	mango
65.	a:^{n} t	N_f	آنت	intestine
66.	a:^{n}T	N_f	آنٹ	peculiar fold of knot, joint (of a finger etc.)
67.	a:^{n} c	N_f	آنچ	flame, file, heat
68.	a:^{n} k (cf. a:^{n} k^{h})	N_f	آنک	eye
69.	a:^{n} k^{h} (cf. a:^{n} k)	N_f	آنکھ	eye
70.	a:^{n} m	N_m	آم	mango
71.	a:^{n} m	Adj	آم (عام)	common
72.	a:^{n} n	N_f	آن	prestige, self-respect
73.	a:^{n} w	N_m	آنو	mucus
74.	I:^{n} T	N_f	اینٹ	brick
75.	u:^{n} T (cf. u:T)	N_m	اونٹ	camel
76.	u:^{n} c	Adj	اونچ	high, upper (caste)
77.	u:^{n} n	N_m	اون	wool
78.	ɛ:^{n} m	Adj	ایم (اہم)	important
79.	ɛ:^{n} n	N_m	عین	twenty-fourth letter of the Urdu alphabet
80.	ɛ:^{n} n	Adj	عین	precise, exact, very
81.	ɔ:^{n} T	V_i/V_t	اونٹ	be boiled; boil
82.	ɔ:^{n} ŋ (cf. ɔ:^{n} ŋg)	V_i	اونگ	doze
83.	ɔ:^{n} ŋg (cf. ɔ:^{n} ŋ)	V_i	اونگ (اونگھ)	doze
84.	pAt	N_f	پت	goodname, honor, character
85.	pAT	N	پٹ	thigh
86.	pAT	N_m	پٹ	leaf of a door or

				window
87.	pAT	N_m	پٹ	sound of falling
88.	pAT	Pred Adj	پٹ	lying flat on one's stomach
89.	pAT	V_i	پٹ	be carried on satisfactorily
90.	pAc	V_i	پچ	be digested
91.	pAk	V_i	پک	be cooked
92.	pAs	N_m	پس	pus
93.	pAs	V_i	پس	be skimmed
94.	pAst	Pred Adj	پست	low; mean
95.	pAl	N_m	پل	eyelid; moment
96.	pAl	V_i	پل	be raised; be brought up
97.	pAr	N_m	پر	feather, wing
98.	pAr	Postp	پر	on, upon
99.	pAr	Conj	پر	but
100.	Pa^{n}nd	N_m	پند	advice, counsel, admonition
101.	pArs	N_m	پرس	purse
102.	pAR	V_i	پڑ	fall down; lie down
103.	pAR (cf. pAR^h)	V_t	پڑ	read; study
104	pAR^h (cf. pAR; p^{h}AR)	V_t	پڑھ	read; study
105.	plt	N_m	پت	gallbladder
106.	plT	V_i	پٹ	be beaten
107.	plc	N_f	پچ	sound of spitting
108.	pls	V_i	پس	be crushed, be cherished, be ground
109.	pll	V_i	پل	rush against; be pocketed
110.	pUT	N_m	پٹ (پٹھ)	upper arm

111.	pUc (cf. pUc^h)	V_t	پُچ	be wiped, be dusted
112.	pUc^h (cf. pUc)	V_t	پُچھ	be wiped, be dusted
113	pUj	V_t	پُج	be worshiped
114.	pUʃt	N_f	پُشت	generation; back
115.	pUl	N_m	پُل	bridge
116.	pUr (cf. pu:r)	Adj	پُر	full; laden; complete,
117.	pA^{n}mp	N_m	پمپ	pump
118.	pA^{n}n	Conj	پن	but
119.	pA^{n}ND	N_m	پنڈ	body
120.	pA^{n}ñc	N_m	پنچ	judge
121.	pA^{n}ñj	Adj	پنج	five
122.	pA^{n}ŋk (cf. pA^{n}ŋk^h)	N_m	پنک	feather, wing
123.	pA^{n}ŋk^h (cf. pA^{n}ŋk; pa:^{n} k^h)	N	پنکھ	feather, wing
124.	pI^{n}n	N_m	پن	pin
125.	pa:	V_t	پا	find out, obtain
126.	pa:p	N_m	پاپ	sin
127.	pa:t	N_m/N_f	پات	leaf
128.	pa:d	N_f	پاد	fart
129.	pa:d	V_i/V_t	پاد	fart, break wind
130.	pa:T	N_m	پاٹ	part
131.	pa:T	N_m	پاٹ	slab
132.	pa:c	N_m	پاچ	emerald
133.	pa:c (cf. pa:ʃ)	N_m	پاچ	noose, snare, net; spider's web, cobweb
134.	pa:k	Adj	پاک	pure, sacred, pious
135.	pa:v	N_m/N_f	پاو	fourth part, quarter; a loaf of bread made in the European

				way
136.	pa:s	Pred Adj	پاس	pass
137.	pa:s	Adv	پاس	near
138.	pa:ʃ (cf. pa: c)	N_m	پاش	noose, snare, net; spider's, web, cobweb
139.	pa:l	N_m	پال	layers of straw used for ripening the unripe mangoes, etc.
140.	pa:l	N_m	پال	temporary place for a short stay
141.	pa:l	N_m	پال	raised bank, embankment (to confine water for irrigation); dam, dike, causeway
142.	pa:l	V_t	پال	bring up
143.	pa:r	Adj	پار	next, last, past
144.	pa:r	Adv	پار	across, on the other side
145.	pa:R	N_m	پاڑ	border of a sari
146.	Pa:R	V_t	پاڑ	throw, fall; waste
147.	pi:	V_t	پی	drink; smoke
148.	pi:p	N_m	پیپ	pus
149.	pi:t	N_m	پیت	juice of the betel leaf chewed and spit out
150.	pi:T (cf. pi:T^h)	N_f	پیٹ	back
151.	pi:T	V_t	پیٹ	beat
152.	pi:T^h (cf. pi:T)	N_f	پیٹھ	back
153.	pi: c (cf. pi:^{n} c)	N_f	پیچ	starch
154.	pi:k	N_m	پیک	stem of a plant (particularly of

				paddy)
155.	pi:s	N_m	پیس	piece
156.	pi:s	V_t	پیس	crush, grind
157.	pi:r	N_m	پیر	saint, Monday
158.	pu:t	N_m	پوت	son
159.	pu:c (cf. pu:c^h)	V_t	پوچ	ask, inquire
160.	pu:c^h (cf. pu:c)	V_t	پوچھ	ask, inquire
161.	pu:j	V_t	پوج	worship
162.	pu:s	N_m	پوس	ninth month of the Hindu calendar
163.	pu:r	N_m	پور	flood
164.	pu:r	Adj	پور	full
165.	pe:	N_m	پے	third letter of the Urdu alphabet
166.	pe:	Postp	پے	on
167.	pe:T	N_m	پیٹ	stomach, belly
168.	pe:c (cf. pe:^{h} c)	N_m	پیچ	screw
169.	pe:j	N_m	پیج	page
170.	pe:ʃ	N	پیش	marker for high vowels u: and U; front part of a house
171.	pe:ʃ	Pred Adj	پیش	presented, offered
172.	pe:l	V_t	پیل	crush; drive on forcibly
173.	pe:R	N_m	پیڑ	tree
174	pe:R	V_t	پیڑ	squeeze
175.	po:p	N_m	پوپ	pope
176.	po:t	V_t	پوت	whitewash
177.	po:T	V_t	پوٹ	persuade

				through flattery
178.	po:c (cf. po:c^{h})	V_t	پوچ	wipe, dust
179.	po:c^{h} (cf. po:c)	V_t	پوچھ	wipe, dust
180.	po:s	V_t	پوس	rear, nourish
181.	po:sT	Pred Adj	پوسٹ	post
182.	po:z	N	پوز	pose
183	po:ʃ	N_m	پوش	covering, garment, raiment
184.	po:l	N_m	پول	pole
185.	po:l	N_f	پول	hollowness
186.	po:r	N	پور	joint of the fingers, knuckle
187.	pɛ:k	N_m; Pred Adj	پیک	pack
188.	pɛ:l	N_m	پیل(پہل)	initiative
189.	pɛ:r	N_m	پیر	foot, leg commencement
190.	pya:s	N_f	پیاس	thirst
191.	pya:z	N_m	پیاز	onion
192.	pya:r	N_m	پیار	love, affection
193.	pa:^{n}c	Adj	پانچ	five
194.	pa:^{n}k^{h} (cf. pA^{n}ŋk^{h})	N_m	پانکھ	feather, wing
195.	pa:^{n}	N_m	پاں	betel leaf; particular preparation of betel leaf
196.	pa:^{n}v	N_m	پانو	foot, leg
197.	pi:^{n}c (cf. pi:c)	N	پینچ	starch
198.	pu:^{n}c (cf. Pu:^{n}c^{h})	N_f	پونچ	tail
199.	pu:^{n}c^{h} (cf. pu^{n}: c)	N_f	پونچھ	tail
200.	pe:^{n}c	N_m	پینچ	screw

	(cf. pe:c)			
201.	pe:^{n}NT	N_m	پینٹ	paint
202.	pɛ:^{n}n	V_t	پین (پہن)	wear, put on
203	pɔ:^{n}c	V_i	پونچ (پہنچ)	reach, arrive
204.	pɔ:^{n}n	Adj	پون	three quarters
205.	p^{h}Ab	V_i	پھب	befit, suit; get opportunity
206.	p^{h}AT	V_i	پھٹ	be torn; be split
207.	p^{h}As (cf. p^{h}A^{n}s)	V_i	پھس	be traped, be entagled
208.	p^{h}Al	N_m	پھل	fruit
209.	p^{h}Al	V_i	پھل	bear fruit; flourish
210.	p^{h}AR	N	پھڑ	flapping of wings
211.	P^{h}AR (cf. pAR^{h})	V_t	پھڑ (پڑھ)	read
212.	p^{h}IT	N_f	پھٹ	curse, malediction
213.	p^{h}Ir	V_i	پھر	be detracted, be changed
214.	p^{h}Ir	Adv	پھر	again, then
215.	p^{h}Ul (cf. p^{h}u:l)	N_m	پھل (پھول)	flower
216.	p^{h}Ul (cf. p^{h}u:l)	V_i	پھل (پھول)	blossom, bloom
217.	p^{h}Ur	N_f	پھر	whir (of a bird); whiz
218.	p^{h}A^{n}n	N_m	پھن	hood of a snake
219.	p^{h}A^{n}nd	N_m	پھند	deception
220.	p^{h}A^{n}s (cf. p^{h}As)	V_i	پھنس	be traped, be entangled
221.	p^{h}a:R	V_t	پھاڑ	tear, rip
222.	p^{h}u:T	N	پھوٹ	split, rift
223.	p^{h}u:T	V_i	پھوٹ	be split
224.	p^{h}u:k	N_f	پھوک	blow

	(cf. p^hu^n:k)			
225.	p^hu:k (cf. p^hu^n:k)	V_t	پھوک	blow
226.	p^hu:s	N	پھوس	old dry glass, straw
227.	p^hu:l (cf. p^hUl)	N_m	پھول	flower; ear-ring; a ceremony performed by muslims in honour of a deceased person on the third day after his death
228.	p^hu:l (cf. p^hUl)	V_i	پھول	blossom, bloom
229.	p^he:T (cf. p^he:^{n}T)	V_t	پھیٹ	mix, beat up into froth
230.	p^he:k (cf. p^he:^{n}k)	V_i/V_t	پھیک	throw; engage in idle talk
231.	p^he:r	N_m	پھیر	Turn, Twist
232.	p^he:r	V_t	پھیر	change; detract
233.	p^ho:R	V_t	پھوڑ	break, crush, split, crack
234.	$p^h\varepsilon$:l	N_f	پھیل(پہل)	initiation
235.	$p^h\varepsilon$:l	V_i	پھیل	be spread; be sprawl
236.	$p^h\supset$:j (cf. f$\supset$:j)	N_f	پھوج (فوج)	army
237.	p^ha:^{n}d (cf. p^ha:^{n}n)	V_i/V_t	پھاند	jump over, leap
238.	p^ha:^{n} k (cf. pA^{n}ŋk^h)	N_m	پھانک	arm
239.	p^ha:^{n}k	N_m	پھانک	piece or slice (of a fruit)
240.	p^ha:^{n} k	V_i/V_t	پھانک	chuck (dry grain, powder) into the mouth from the palm
241.	p^ha:^{n}n (cf. p^ha^n:d)	V_i/V_t	پھان	jump over, leap
242.	p^ha:^{n} s	V_t	پھانس	entrap, trap

243.	p^hu^n:k (cf. p^hu:k)	N_f	پھونک	blow
244.	p^hu^n:k (cf. p^hu:k)	V_t	پھونک	blow
245.	p^he^n:T (cf. p^he:T)	V_t	پھینٹ	mix, beat up into froth
246.	p^he^n:k (cf. p^he:k)	V_i/V_t	پھینک	throw; engage in idle talk
247.	p^he:^{n}n	N_m	پھین	froth, foam
248.	bAd	Adj	بد	bad, corrupt
249.	bAT	N_m	بٹ	tripe
250.	bAT (cf. ba:T)	N_m	بٹ	weight; measure
251.	bAT (cf. BA^{n}T: ba:^{n}T)	V_i	بٹ	be divided, be distributed
252.	bAc	V_i	بچ	be left; escape
253.	bAj	V_i	بج	be rung; ring
254.	bAk	V_i/V_t	بک	prattle, chatter
255.	bAks f~bAkAs	N_m	بکس	box
256.	bAg	N_m	بگ (بگلا)	heron; crane
257.	bAs	N_m	بس	power, authority
258.	bAs	N_f	بس	bus
259.	bAs	V_i	بس	settle down, abide
260.	bAs	Intrj	بس	enough, sufficient
261.	bAsT	Pred Adj	بسٹ	burst
262.	bAzm	N_f	بزم	social gathering; party
263.	bAxʃ	V_t	بخش	give; bestow
264.	bArx	N_f	برخ (برق)	lightening; electricity
265.	bAl	N_m	بل	power, force
266.	bAl	N_m	بل	twist, turn, twinkle

267.	bAlb f~bAlAb	N_m	بلب	bulb
268.	bAr (cf. vAr)	N_m	بر	suitor; prospective bridegroom
269.	bAr	prep	بر	on, upon
270.	bAr	N_m	بر	fruit
271.	bArf f~bArAf	N_m	برف	snow, ice
272.	bAR	N_m	بڑ	banyan tree, Indian fig-tree
273.	bAR (cf. bAR^h)	V_i	بڑ	grow
274.	bAR^h (cf. bAR)	V_i	بڑھ	grow
275.	blc (cf. blc^h)	V_i	بچ	be stretched, be spread
276.	blc^h (cf. blc)	V_i	بچھ	be spread, be stretched
277.	blk	V_i	بک	be sold
278.	bll	N_m	بل	hole, burrow
279.	bll	N_m	بل	bill
280.	bUt	N_m	بت	idol
281.	bUd	N_m	بد (بدھ)	Wednesday
282.	bUd	N_m	بد (بدھ)	Lord Buddha
283.	bUj (cf. bUj^h)	V_i	بج	be put out, extinguished
284.	bUj^h (cf. bUj)	V_i	بجھ	be put out, extinguished
285.	bUr (cf. bu:r)	N_m	بر	hole; vulva
286.	bA^{n}m	N_m	بم	bomb
287.	bA^{n}n	N_m	بن	forest
288.	bA^{n}n	V_i	بن	be made, formed
289.	bA^{n}nd	Adj	بند	closed, shut
290.	bI^{n}n	Postp	بن	without

291.	bi^{n}ʧ	N_f	بنچ	bench
292.	bU^{n}n	V_t	بُن	weave, knit
293.	ba:p	N_m	باپ	father
294.	ba:b	N_m	باب	lesson, chapter
295.	ba:t	N_f	بات	talk, matter, conversation
296.	ba:d	N_f	باد	wind
297.	ba:d	Adv	باد(بعد)	after, afterwards
298.	ba:T	N_m	باٹ	way, road, path
299.	ba:T	N_m	باٹ	weight; measure
300.	ba:j	Prep	باج	without, in the absence
301.	ba:g	N_m	باگ (باگھ)	lion, tiger
302.	ba:g	N_f	باگ	reign, briddle
303.	ba:f	N_f	باف	cloth interwoven with gold, gold tissue
304.	ba:s	N_f	باس	conversation, talk
305.	ba:s	N_f	باس	smell, odor
306.	ba:z	N_m	باز	hawk; female falcon
307.	ba:z	Adj	باز	some, a few
308.	ba:z	Adj; Intrj	باز(بعض)	refrain, abstain (from); hold! stop!
309.	ba:ɣ	N_m	باغ	garden, orchard
310.	ba:l	N_m	بال	hair
311.	ba:r	N_f	بار	chance, turn, occasion
312.	ba:r	N_m	بار	load, burden
313.	ba:R	N_m	باڑ (باڑھ)	flood
314.	bi:t	V_i	بیت	pass, befall
315.	bi:c	N_m	بیچ	center, middle

316.	bi:j	N_m	بیج	seed
317.	bi:s	Adj	بیس	twenty
318.	bu:	N_f	بو	odor, smell
319.	bu:d	N_f	بود	existence
320.	bu:T	N_m	بوٹ	boot
321.	bu:j (cf. bu:j^h)	V_i/V_t	بوج	know, understand (as a riddle)
322.	bu:j^h (cf. bu:j)	V_i/V_t	بوجھ	know, understand (as a riddle)
323.	bu:m	N_m	بوم	owl
324.	bu:r (cf. bUr)	N_m	بور	hole; vulva
325.	be:	N_m	بے	second letter of the Urdu alphabet
326.	be:t (cf. be:d)	N_f	بیت	cane
327.	be:d (cf. be:t)	N_f	بید	cane
328.	be:c	V_t	بیچ	sell
329.	be:g (cf. bɛ:g)	N_m	بیگ	bag
330.	be:g	N_m	بیگ	Beg: a Mughal title
331.	be:l	N_f	بیل	creeping plant; embroidery
332.	be:l	N_m	بیل	the bel-tree, wood-apple
333.	be:l	V_t	بیل	roll dough into flat, round bread for baking
334.	be:r	N_f	بیر	time, turn, bout
335.	be:r	N	بیر	the ber-fruit
336.	bo:	V_t	بو	sow
337.	bo:T	N_m	بوٹ	finger's breadth,

				inch
338.	bo:D	N_m	بوڈ	board
339.	bo:j (cf. bo:j^h)	N_m	بوج	load, burden
340.	bo:j^h (cf. bo:j)	N_m	بوجھ	load, burden
341.	bo:z	N_m	بوز	cream colored horse, horse
342.	bo:l	N_m	بول	speech, utterance
343.	bo:l	V_i	بول	speak, say, utter
344.	bo:r	Adj	بور	boring, tiresome
345.	bɛ: (cf. b^{h}ɛ:)	V_t	بۓ (بہہ)	float; flow
346.	bɛ:T (cf. bɛ:T^h)	V_i	بیٹ	sit down
347.	bɛ:T^h (cf. bɛ:T)	V_i	بیٹھ	sit down
348.	bɛ:g (cf. be:g)	N_m	بیگ	bag
349.	bɛ:s (cf. b^{h}ɛ:s)	N_f	بیس (بحث)	argument, discussion
350.	bɛ:l	N_m	بیل	ox
351.	bɛ:l (cf. b^{h}ɛ:l)	V_i	بیل (بہل)	be amused, be diverted
352.	bɛ:r	N_m	بیر	enmity, animosity, malice
353.	bɔ:l	N_f	بول	ball
354.	ba:^{n}	N_f	باں	arm
355.	ba:^{n}d (cf. ba:^{n}n)	N_m	باند	embankment; dam; fastening
356.	ba:^{n}d (cf. ba:^{n}d^h)	V_t	باند	bind, tie, fasten
357.	ba^n:d^h (cf. ba^n:d)	V_t	باندھ	bind, tie, fasten
358.	ba^n:T	V_t	بانٹ	distribute, divide

359.	ba:^{n}j	Adj	بانج	barren (woman)
360.	ba:^{n}k	N_m	بانک	dagger with a curved blade
361.	ba:^{n}m	N_m	بام	balm
362.	ba:^{n}m	N_f	بام	eel
363.	ba:^{n}n	N_m	بان	arrow
364.	ba:^{n}n (cf. ba:^{n}d)	N_m	بان (باندھ)	embankment; dam; fastening
365.	ba:^{n}ŋ (cf. ba:^{n}ŋg)	N_f	بانگ	crowing (of a cock)
366.	ba:^{n}ŋg (cf. ba:^{n}ŋ)	N_f	بانگ	crowing (of a cock)
367.	ba:^{n}s	N_m	بانس	bamboo
368.	bi:^{n}m	N_f	بیم	lintel
369.	bi:^{n}n	N_f	بین	Indian flute
370.	bu:^{n}d (cf. bu:^{n}n)	N_f	بوند	drop
371.	bu:^{n}n (cf. bu:^{n}d)	N_f	بون	drop
372.	bo:^{n}	N	بوں	price
373.	bɛ:^{n}n	N_m	بین	lamentation, wailing
374.	bɛ:^{n}n	N_f	بین (بہن)	sister
375.	b^{h}As	V_i	بھس	float
376.	b^{h}Ar	V_i/V_t	بھر	be filled; fill
377.	b^{h}Ar	Encl Pcl	بھر	full, complete, whole, entire
378.	b^{h}IR	V_i	بھڑ	come into collision
379.	b^{h}U^{n}n	V_i	بھن	be roasted
380.	b^{h}a:	V_i	بھا	seem good, be approved
381.	b^{h}a:p	N	بھاپ	steam, vapor
382.	b^{h}a:g	N_m	بھاگ	luck, fate
383.	b^{h}a:g	V_i	بھاگ	run away, flee

384.	bʰa:r	N_m	بھار	load, burden, weight
385.	bʰa:R	N_m	بھاڑ	furnace
386.	bʰi:	Emph Pcl	بھی	also, too, even
387.	bʰi:k	N_f	بھیک	begging, alms
388.	bʰi:g	V_i	بھیگ	be wet, be moist
389.	bʰi:R	N_f	بھیڑ	crowd
390.	bʰu:t	N_m	بھوت	evil spirit, demon, ghost
391.	bʰu:k	N_f	بھوک	hunger
392.	bʰu:l	N_f	بھول	forgetfulness; mistake
393.	bʰu:l	V_i	بھول	forget, err
394.	bʰe:d	N_m	بھید	secret
395.	bʰe:j	V_t	بھیج	send
396.	bʰe:s	N_m	بھیس	appearance
397.	bʰe:R	V_t	بھیڑ	shut, close
398.	bʰo:j	N_m	بھوج	feast
399.	bʰo:g	N_m	بھوگ	enjoyment, fruition
400.	bʰo:r	N_m	بھور	dawn, break of day
401.	bʰɛ:s (cf. bɛ:s)	N_f	بھیس (بحث)	argument, discussion
402.	bʰɛ:l (cf. bɛ:l)	V_i	بھیل (بہل)	be amused, be diverted
403.	bʰɔ:	N_f	بھو (بہو)	daughter-in-law
404.	bʰɔ:t	Adj; Adv	بھت (بہت)	much, many; very, considerably
405.	bʰa:ⁿŋ (cf. bʰa:ⁿŋg)	N_f	بھانگ	hemp plant, cannabis sativa; intoxicating drink made of the leaves of hemp

406.	$b^ha:^n\eta g$ (cf. $b^ha:^n\eta$)	N_f	بھانگ	hemp plant, cannabis sativa; intoxicating drink made of the leaves of hemp
407.	$b^hu:^nk$ (cf. $b^h\supset:^nk$)	V_t	بھونک	bark (as a dog)
408.	$b^hu:^nn$	V_t	بھون	roast
409.	$b^he:^nR$	N_f	بھیڑ	sheep
410.	$b^ho:^nk$	V_t	بھونک	pierce, thrust
411.	$b^h\varepsilon:^nn$ (cf. $b\varepsilon:^nn$)	N_f	بھین (بہن)	sister
412.	$b^h\varepsilon:^ns$	N_f	بھینس	cow buffalo
413.	$b^h\supset:^n$	N	بھوں	eyebrow
414.	$b^h\supset:^nk$	V_t	بھونک	bark (as a dog)
415.	tAp	V_t	تپ	be heated, be warmed
416.	tAb	Conj	تب	then; thereupon
417.	tAk	N_f	تک	a balance, a scale (esp. a large one for weighing heavy goods)
418.	tAk	V_t	تک	look, glance; aim
419.	tAk	Postp	تک	to, toward, up to,till, until
420.	tAg	N_f	تگ	running, flying, rushing
421.	tA∫t	N_m	تشت (طشت)	large platter
422.	tAxt f~tAxAt	N_m	تخت	throne, chair of state
423.	tAl	V_t	تل	fry
424.	tAlx	Adj	تلخ	bitter, harsh
425.	tAr	Adj	تر	wet, moist
426.	tArk	N_m	ترک	abondoning, setting aside;

				abondonment
427.	tAR	N_m	تڑ	sound produced by quick, successive strokes
428.	tIb	N_f	تب(طب)	Unani medicine
429.	tIl	N_m	تل	sesame seed; mole
430.	tUj (cf. tu:)	Pers Pron	تج(تجھ)	Thee, You; obl. sg. of tu:
431.	tUl	V_i	تل	be weighed; confront, be drawn up in battle
432.	tUrk	N_m	ترک	Turk
433.	tUrʃ	Adj	ترش	sour
434.	tA^{n}n	N_m	تن	body
435.	tA^{n}n	V_t	تن	stretch; be pulled tight
436.	tA^{n}nz	N_m	تنز(طنز)	taunt, ridicule
437.	tA^{n}ŋ (cf. tA^{n}ŋg)	Adj	تنگ	narrow, tight; distressed, dejected
438.	tA^{n}ŋg (cf. tA^{n}ŋ)	Adj	تنگ	narrow, tight; distressed, dejected
439.	tU^{n}m (cf. a:p; tu:)	Pers Pron	تم	you (neutral)
440.	tU^{n}nd	Adj	تند	strong, violent, severe
441.	ta:	Adv	تا	up to, until
442.	ta:p	V_t	تاپ	heat, warm (oneself)
443.	ta:b	N_f	تاب	strength, power; brightness, luster
444.	ta:j	N_m	تاج	crown
445.	ta:k (cf. tAk)	V_i/V_t	تاک	look at, stare at, gaze on
446.	ta:v	N_m	تاو	heat, warmth

	f~ta:o			
447.	ta:ʃ	N_m	تاش	playing card
448.	ta:x	N_m	تاخ (طاق)	niche; shelf
449.	ta:l	N_m	تال	clapping; chine
450.	ta:r	N_m	تار	wire, cord; telegram
451.	ta:R	N_m	تاڑ	palm tree
452.	ta:R	V_t	تاڑ	guess
453.	ti:j	N_f	تیج	third day of a lunar fortnight
454.	ti:s	Adj	تیس	thirty
455.	ti:r	N_m	تیر	arrow
456.	ti:r	N_f	تیر	fourth solar month of the Persian year (corresponding to the Hindi Sawan)
457.	tu: (cf. tU^{n}m; a:p)	Pers Pron	تو	you (rude; intimate)
458.	tu:t	N_m	توت	mulberry
459.	tu:r	N_m	تور (طور)	Mount Sinai
460.	te:	N_m	تے	fourth letter of the Urdu alphabet
461.	te:z	Adj	تیز	sharp
462.	te:ɣ	N_f	تیغ	sword
463.	te:l	N_m	تیل	oil
464.	to:	N_m	تو (ط)	twenty-second letter of the Urdu alphabet
465.	to:	Conj	تو	then, therefore
466.	to:p	N_f	توپ	cannon
467.	to:p	V_t	توپ	cover, bury
468	to:R	V_t	توڑ	break
469.	tɛ:	N_f	تے (تہہ)	layer, fold

470.	tɛ:	Pred Adj	تے(طے)	concluded, settled, decided, fixed
471.	tɛ:ʃ	N_m	تیش (طیش)	anger, passion, rage
472.	tɛ:r	V_t	تیر	swim, float
473.	tɔ:x	N_m	توخ (طوق)	neck-ring; collar (of iron) for punishment
474.	tɔ:l	V_t	تول	weigh, measure
475.	tɔ:r	N_m	تور(طور)	manner, mode, loom
476.	ta:^{n}t	N_f	تانت	thread, fibre, way, style
477.	ta^n:n	N_f	تان	keynote, tune, tone
478.	ta:^{n}n	V_t	تان	extend, stretch, expand, pull
479.	ti:^{n}n	Adj	تین	three
480.	to:^{n}d (cf. to:^{n}n)	N_f	توند	large belly
481.	to:^{n}n (cf. to:^{n}d)	N_f	تون	large belly
482.	t^{h}AK	V_i	تھک	be tired, be exhausted
483.	t^{h}Al	N_m	تھل	land; soil, ground
484.	t^{h}Up	V_t	تھپ	be plastered; be imposed
485.	t^{h}A^{n}m	N_m	تھم	pillar, post; stem of a tree
486.	t^{h}A^{n}m	V_i	تھم	be stoped; stand still
487.	t^{h}A^{n}n	N_m	تھن	udder
488.	t^{h}a:	N_f	تھا(تھاہ)	depth, bottom; trace
489.	t^{h}a: (cf. t^{h}e:; t^{h}i:; t^{h}i:^{n})	Past Aux	تھا	was (masc. sg.)
490.	t^{h}a:p	N_m	تھاپ	slap

491.	$t^ha:k$	N_m	تھاک	mass, heap
492.	$t^ha:l$	N	تھال	large flat metal plate; platter
493.	$t^hi:$ (cf. $t^ha:$)	Past Aux	تھی	was (fem. sg.)
494.	$t^hu:k$	N_m	تھوک	spittle, saliva
495.	$t^hu:k$	V_t	تھوک	spit
496.	$t^he:$ (cf. $t^ha:$)	Past Aux	تھے	were (masc. pl.)
497.	$t^ho:p$	V_t	تھوپ	plaster; impose
498.	$t^ho:k$	N_m	تھوک	multitude, mass; wholesale
499.	$t^ha:^nm$	V_t	تھام	hold, clutch; stop
500.	$t^ha:^nn$	N_f	تھان	bolt (of cloth), material (in yardage)
501.	$t^hi:^n$ (cf. $t^ha:$)	Past Aux	تھیں	were (fem. pl.)
502.	dAb	V_t	دب	be pressed down, be squeezed
503.	dAb	Pred Adj	دب	less, deficient, lower
504.	dAfn f~dAfA^{n}n	Pred Adj	دفن	burial; concealing
505.	dAs	Adj	دس	ten
506.	dAst	N_m	دست	loose motion; hand
507.	dAʃt	N_m	دشت	forest
508.	dAxl f$_n$dAxAl	N_m	دخل	entry; interference
509.	dAl	N_m	دل	mass, heap; great number
510.	dAl (cf. dAr)	V_t	دل	grind coarsely, crush
511.	dAr	N_m	در	door, gate
512.	dAr	V_t	در	grind coarsely,

	(cf. dAl)			crush
513.	dArd f~dArAd	N_m	درد	pain; sympathy, pathos
514.	dArj	N_m	درج	entry, registration, enrollment
515.	dArs	N_m	درس	lesson; preaching
516.	dIk (cf. dIk^h)	V_i	دک	be seen; appear
517.	dIk^h (cf. dIk)	V_i	دکھ	be seen; appear
518.	dIx	Pred Adj	دخ(دق)	annoy, irritate
519.	dII	N_m	دل	heart
520.	dUk (cf. dUk^h)	N_m	دک	pain, sorrow, trouble
521.	dUk (cf. dUk^h)	V_i	دک	pain, trouble
522.	dUk^h (cf. dUk)	N_m	دکھ	pain, sorrow, trouble
523.	dUk^h (cf. dUk)	V_i	دکھ	pain, trouble
524.	dUr	N_m	در	pearl
525.	dUr	Intrj	در	away!, begone!
526.	dA^nm	N_m	دم	breath; simmering, cooking in steam
527.	dA^nn	N_m	دن	speed, swiftness
528.	$dA^nŋ$ (cf. $dA^nŋg$)	Pred Adj	دنگ	astonished, wonderstruck
529.	$dA^nŋg$ (cf. $dA^nŋ$)	Pred Adj	دنگ	astonished, wonderstruck
530.	dI^nn	N_m	دن	day
531.	dU^nm	N_f	دم	tail
532.	da:b	N_m	داب	magnificience, ostentation
533.	da:b	V_t	داب	press down, supress, squeeze

534.	da:d	N_f	داد	appreciation, praise
535.	da:k (cf. da:k^h)	N_f	داک	grape; raisin
536.	da:k^h (cf. da:k)	N_f	داکھ	grape; raisin
537.	da:g (cf. da:γ)	N_m	داگ	scar, mark, spot; morbid whiteness of the skin
538.	da:g (cf. da:γ)	V_t	داگ	brand (with a hot iron); fire (a gun,cannon, etc.)
539.	da:s	N_m	داس	siekle; scythe
540.	da:s	N_m	داس	slave
541.	da:γ (cf. da:g)	N_m	داغ	scar, mark, spot; morbid whiteness of the skin
542.	da:γ (cf. da:g)	V_t	داغ	brand (with a hot iron); fire (a gun, cannon, etc.)
543.	da:l	N_m	دال	eleventh letter of the Urdu alphabet
544.	da:l	N_f	دال	split pulse
545.	da:r	N_m	دار	wood, a piece of wood; gallows, gibbet, impaling stake
546.	da:r	N_m	دار	house, mansion, habitation
547.	da:R	N_m	داڑ	jaw-tooth
548.	di:p	N_m	دیپ	lamp
549.	du:	V_t	دو(دوہ)	milk
550.	du:b	N_m	دوب	grass
551.	du:t	N_m	دوت	messenger
552.	du:d	N_m	دود	milk

553.	du:j	N_m	دوج	second day of a lunar fortnight
554.	du:r	N; Adj	دور	distance; far, distant
555.	de:	N_m	دیہ	body, person
556.	de:	V_t	دے	give
557.	de:k (cf. de:k^h)	V_t	دیک	see, look at, behold
558.	de:k^h (cf. de:k)		دیکھ	see, look at, behold
559.	de:g (cf. de:ɣ)	N_m	دیگ	a large metal pot; caldron
560.	de:v	N_m	دیو	evil spirit, devil demon
561.	de:v	N_m ;Adj	دیو	deity, celestial being; of or belonging to deity or divinity
562.	de:s (cf. de:ʃ)	N_m	دیس	place, region, country
563.	de: ʃ (cf. de:s)	N_m	دیش	place, region, country
564.	de: ɣ (cf. de:g)	N_m	دیغ	a large metal pot; caldron
565.	de:r	N_f	دیر	delay, tardiness
566.	do:	Adj	دو	two
567.	do:s (cf. do:st)	N_m	دوس (دوست)	friend
568.	do:st (cf. do:s)	N_m	دوست	friend
569.	dɑ:r	N_m	دیر	place of worship; temple
570.	dɔ:r	N_m	دور	age, period, era
571.	dɔ:R	N_f	دوڑ	race
572.	dɔ:R	V_i	دوڑ	run
573.	dwa:r	N_m	دوار	door, gate

574.	da:^{n}t	N_m	دانت	tooth
575.	da:^{n}m	N_m	دام	money; price, value
576.	da:^{n}m	N_m	دام	net, snare
577.	da:^{n}n	N_m	دان	gift, donation, charity
578.	di:^{n}n	N_m	دین	faith, religion
579.	de:^{n}n	N	دین	gift, debt
580.	dɛ:^{n}t	N_m	دینت	demon, giant
581.	d^{h}Ap	N_f	دھپ	sound of falling
582.	d^{h}At	Intrj	دھت	away!, begone!
583.	d^{h}Ak	N	دھک	shock; sudden impression of terror
584.	d^{h}Ak	N_f	دھک	small louse
585.	d^{h}As (cf. d^{h}A^{n}s)	V_t	دھس	sink, pierce; yield, give way
586.	d^{h}AR	N_m	دھڑ	body (exclusive of head)
587.	d^{h}Ip	V_t	دھپ	be heated, be warmed
588.	d^{h}UI	V_t	دھل	be washed
589.	d^{h}A^{n}m	N_f	دھم	thud, loud noise
590.	d^{h}A^{n}n	N_m	دھن	wealth, property
591.	d^{h}A^{n}s (cf. d^{h}As)	V_t	دھنس	sink, pierce; yield, give way
592.	d^{h}U^{n}n	N_f	دھن	tune, melody; longing passion
593.	d^{h}U^{n}n	V_t	دھن	comb (cotton); beat
594.	d^{h}U^{n}nd	N_f	دھند	mist, haze, fog
595.	d^{h}a:t	N_f	دھات	metal
596.	d^{h}a:g	N_f	دھاگ (دھاک)	fear, terror
597.	d^{h}a:r	N_f	دھار	sharpness, edge; water current

598.	$d^ha:R$	N_f	دھاڑ	roaring, thundering; lound noise or cry
599	$d^ha:R$	V_t	دھاڑ	roar, cry
600.	$d^hu:p$	N_f	دھوپ	sunshine, sunlight
601.	$d^hu:l$	N_f	دھول	dust
602.	$d^ho:$	V_t	دھو	wash, clean
603.	$d^ha:^nn$	N_m	دھان	paddy
604.	$d^ha:^nŋ$ (cf. $d^ha:^nŋg$)	V_t	دھانگ	mess (bedding, etc.)
605.	$d^ha:^nŋg$ (cf. $d^ha:^nŋ$)	V_t	دھانگ	mess (bedding, etc).
606.	$d^hu:^nm$	N_f	دھوم	celebrity
607.	$d^hya:^nn$	N_m	دھیان	attention, concentration
608.	TAp	N_m	ٹپ	sound of dripping (water)
609.	Tap	V_i	ٹپ	jump, spring, vault
610.	TAb	N_m	ٹب	tub
611.	TAk	V_i	ٹک	be stitched
612.	TAl	V_i	ٹل	pass over, pass off
613.	TAr	N_f	ٹر	croak
614.	Tlk	V_i	ٹک	stop, stay; abide; last, continue
615.	TA^nn	N_m	ٹن	ton
616.	TA^nn	N_f	ٹن	sound of ringing (as of bell, etc.)
617.	TA^nn	V_i	ٹن	be stretched, be extended ; be tightened
618.	$TA^nŋ$ (cf. $TA^nŋg$)	V_i	ٹنگ	be hung, be suspended
619.	$TA^nŋg$	V_i	ٹنگ	be hung, be

	(cf. TA^{n}ŋ)			suspended
620.	TU^{n}n	Pred Adj	ٹُن	intoxicated
621.	Ta:p	N_f	ٹاپ	hoof (of a horse); sound (of a horse's hoof)
622.	Ta:T	N_f	ٹاٹ	mat; sackcloth, canvas
623.	Ta:l	V_t	ٹال	put off
624.	Ti:p	V_t	ٹیپ	compress, squeeze
625.	Tu:T	V_i	ٹوٹ	be broken, be damaged, be fractured
626.	Tu:r	N_m	ٹور	tour
627.	Te:	N_m	ٹے	fifth letter of the Urdu alphabet
628.	Te:p	N_m	ٹیپ	tape recorder
629.	Te:k	N_m	ٹیک	support
630.	To: (cf. T^{h}o:)	N_f	ٹو(ٹوہ)	search, track
631.	To:	V_t	ٹو	feel, touch, search
632.	To:p	N_f	ٹوپ	hat
633.	To:k	V_t	ٹوک	question, interrogate
634.	Tɛ:l	V_i	ٹہل (ٹہل)	walk to and fro; take a walk
635.	T⊃:p	N_m	ٹوپ	kind of earring
636.	T⊃:rc	N	ٹورچ	torch
637.	Ta:^{n}k	V_t	ٹانک	join; fasten; stitch
638.	Ta:^{n}ŋ (cf. Ta:^{n}ŋg)	N_f	ٹانگ	leg
639.	Ta:^{n}ŋ (cf. Ta:^{n}ŋg)	V_t	ٹانگ	hang
640.	Ta:^{n}ŋg (cf. Ta:^{n}ŋ)	N_f	ٹانگ	leg

641.	Ta:^{n}ŋg (cf. Ta:^{n}ŋ)	V_t	ٹانگ	hang
642.	Ti:^{n}m	N_f	ٹیم	team
643.	Ti:^{n}n	N_m	ٹین	tin
644.	Te:^{n}	N_f	ٹیں	inarticulate sound (indicating defeat or death)
645.	T^{h}Ap	Pred Adj	ٹھپ	inert
646.	T^{h}Ak	N_f	ٹھک	sound of knocking
647.	T^{h}Ag	N_m	ٹھگ	robber; cheat
648.	T^{h}Ag	V_t	ٹھگ	cheat , deceive
649.	T^{h}Uk	V_t	ٹھک	be hammered
650.	T^{h}A^{n}n	V_t	ٹھن	be fixed; be resolved; be ascertained
651.	T^{h}A^{n}ND	N_f	ٹھنڈ	coldness, chilliness
652.	T^{h}a:T	N_f	ٹھاٹ	abudance; luxury
653.	T^{h}i:k	Adj	ٹھیک	right, correct, complete
654.	T^{h}a:r	N_m	ٹھار	snow, frost
655.	T^{h}u:s (cf. T^{h}u:^{n}s)	V_t	ٹھوس	thrust in, press down
656.	T^{h}e:s	N_f	ٹھیں	knock, blow
657.	T^{h}e:l	V_t	ٹھیل	push forcefully, propel
658.	T^{h}o: (cf. To:)	N_f	ٹھو(ٹوہ)	search, track
659.	T^{h}o:k	V_t	ٹھوک	hammer, strike
660.	T^{h}o:s	Adj	ٹھوس	solid, hard, firm, compact
661.	T^{h}a:n	V_t	ٹھان	set the heart upon; fix, settle, resolve
662.	T^{h}a:^{n}n	N_m	ٹھان	place for tying up an animal,

				stall
663.	$T^hu:^ns$ (cf. $T^hu:s$)	V_t	ٹھونس	thrust in, press down
664.	DAT	V_t	ڈٹ	be firm
665.	DAs	V_t	ڈس	bite (as a snake)
666.	DAl	V_t	ڈل	be poured, be put in
667.	DAr	N_m	ڈر	fear, fright, apprehension
668.	DAr	V_t	ڈر	fear; be frightened
669.	DUl	V_t	ڈل	move, stir; shake
670.	DA^nn	N	ڈن	arm
671.	DA^nND	N_m	ڈنڈ	fine, penalty
672.	$DA^nŋk$	N_m	ڈنک	sting of wasp or scorpion
673.	DA^ns (cf. DAs)	V_t	ڈنس	bite (as a snake)
674.	DI^nm	Pred Adj	ڈم	dim
675.	Da:b	N_m	ڈاب	green coconut
676.	Da:T (cf. $Da:^nT$)	N_f	ڈاٹ	scolding
677.	Da:T (cf. $Da:^nT$)	V_t	ڈاٹ	scold, chide, rebuke
678.	Da:k	N_f	ڈاک	mail
679.	Da:l	N_m	ڈال	twelfth letter of the Urdu alphabet
680.	Da:l	N_f	ڈال	branch of a tree
681.	Da:l	V_t	ڈال	pour, put in
682.	Du:b	V_i	ڈوب	sink; be drowned
683.	De:g	N_m	ڈیگ	step
684.	De:R (cf. $De:R^h$)	Adj	ڈیڑ	one and a half
685.	$De:R^h$	Adj	ڈیڑھ	one and a half

	(cf. De:R)			
686.	Do: (cf. d^ho:)	N_m	ڈو (ڈوہ)	deep water, deep pool
687.	Do:l	N	ڈول	bucket
688.	Do:l	V_t	ڈول	move to and fro; swing
689.	Do:r	N_f	ڈور	thread, string
690.	Da:^{n}T (cf. Da:T)	N_f	ڈانٹ	scolding
691.	Da:^{n}T (cf. Da:T)	V_t	ڈانٹ	scold, chide, rebuke
692.	Da:^{n}ns	N_m	ڈانس	dance
693.	D^hAk	V_t	ڈھک	cover, conceal
694.	D^hAl	V_i	ڈھل	decline, fade
695.	D^hUl	V_i	ڈھل	be carried, be transported
696.	D^hA^{n}ŋ (cf. D^hA^{n}ŋg)	N_m	ڈھنگ	way, manner, fashion
697.	D^hA^{n}ŋg (cf. D^hA^{n}ŋ)	N_m	ڈھنگ	way, manner, fashion
698.	D^ha:l	N_f	ڈھال	shield
699.	D^ha:l	N_f	ڈھال	slope
700.	D^ha:l	V_t	ڈھال	mould; shape
701.	D^hi:T (cf. d^hi:^{n}T)	Adj	ڈھیٹ	stubborn
702.	D^hi:l	N_f	ڈھیل	loosening, slackening
703.	D^he:r	N_m	ڈھیر	heap, pile
704.	D^ho: (cf. Do:)	N_m	ڈھو	deep water deep pool
705.	D^ho:	V_t	ڈھو	carry, transport
706.	D^ho:l	N_m	ڈھول	drum
707.	D^ho:l	V_t	ڈھول	winnow; sift
708.	D^hɛ:	V_i	ڈھۓ	pull down
709.	D^ha:^{n}p	V_t	ڈھانپ	cover

	(cf. $D^ha:^nk$)			
710.	$D^ha:^{n}k$ (cf. $D^ha:^np$)	V_t	ڈھانک	cover
711.	$D^hi:^nT$ (cf.$D^hi:T$)	Adj	ڈھینٹ	stubborn
712.	$D^ho:^nŋ$ (cf. $D^ho:^nŋg$)	N_m	ڈھونگ	deceit, fraud
713.	$D^ho:^nŋg$ (cf. $D^ho:^nŋ$)	N_m	ڈھونگ	deceit, fraud
714.	cAT	Nm; Adv	چٹ	sound of cracking; quick'y
715.	cAT	V_i	چٹ	be bored
716.	cAk	N_m	چک	eye
717.	cAk (cf. cAk^h)	V_t	چک (چکھ)	taste, eat; enjoy; experience
718.	cAk^h (cf. cAk)	V_t	چکھ	taste, eat; enjoy; experience
719.	cAʃm	N_f	چشم	eye
720.	cAl	V_i	چل	move, go
721.	cAr	V_i	چر	graze, pasture
722.	cArc	N_m	چرچ	church
723.	cArx	N_m	چرخ	wheel; a potter's wheel; the celestial globe or orb
724.	cAR	N	چڑ	sound of tearing or cracking
725.	cAR (cf. cAR^h)	V_t	چڑ	climb, mount
726.	cAR^h (cf. cAR)	V_t	چڑھ	climb, mount
727.	clt	N_m	چت	heart, mind, soul intellect
728.	clt	Pred Adj	چت	lying flat (on the back), prostrate
729.	clT	N_f	چٹ	slip, piece, scrap

730	clk	N_f	چک	mat-curtain
731.	clR (cf. clR^h)	N_f	چڑ	offence, hate
732.	clR (cf. clR^h)	V_i	چڑ	be irritated, be provoked
733.	clR^h (cf. clR)	N_f	چڑھ	offence, hate
734.	clR^h (cf. clR)	V_i	چڑھ	be irritated, be provoked
735.	cUp	N_f; Adj	چپ	silence, quiet; silent, secret
736.	cUb	V_i	چب (چبھ)	be pricked, be pierced
737.	cUd	V_i	چد	be copulated with
738.	cUg	V_i	چگ	peck
739.	cUst	Adj	چست	quick, active; adroit; tight
740.	cUr	V_i	چر	be stolen
741.	cAND	Adj	چنڈ	clever
742.	cUn	V_i/V_t	چن	gather, pick; choose, select
743.	ca:	N_f	چا(چاہ)	wish, desire, inclination
744.	ca:	V_t	چا(چاہ)	wish, desire, love
745.	ca:p	N_f	چاپ	sound of footsteps
746.	ca:T	V_t	چاٹ	lick; taste
747.	ca:T	Adj	چاٹ	a cheat, a rogue
748.	ca:k	N_m; Adj	چاک	slit; open
749.	ca:ʃt	N_f	چاشت	the middle hour between sunrise and the meridian; morning prayer
750.	ca:x	Adj	چاخ (چاق)	active, alert; erect, ready
751.	ca:l	N_f	چال	motion,

				movement, walk; conduct, behavior
752.	ca:r	Adj	چار	four
753.	ci:p	V_t	چیپ	press, crush
754.	ci:j (cf. ci:z)	N_f	چیج	thing, article, commodity
755.	ci:z (cf. ci:j)	N_f	چیز	thing, article, commodity
756.	ci:x	N_f	چیخ	scream, cry
757.	ci:x	V_t	چیخ	scream, cry, yell
758.	ci:l	N	چیل	kite
759.	ci:r	V_t	چیر	cut open, tear, slit, separate
760.	cu:	V_i	چو	leak, drop
761.	cu:t	N_f	چوت	vulva
762.	cu:k	N_f	چوک	mistake, error
763.	cu:k	V_i	چوک	commit error
764.	cu:s	V_t	چوس	suck, absorb, drink in
765.	cu:r	N_m	چور	powder
766.	cu:r	V_t	چور	crush, reduce to small pieces
767.	ce:	N_m	چے	eighth letter of the Urdu alphabet
768.	co:d	V_t	چود	copulate with
769.	co:T	N_f	چوٹ	wound, injury
770.	co:c (cf. co:^{n}c)	N_f	چوچ	beak
771.	co:r	N_m	چور	thief, robber
772.	cɛ:t	N_m	چیت	first month of the Hindu calendar
773.	cɔ:k	N_f	چوک	chalk
774.	ca:^{n}d	N_m	چاند	moon

	(cf. ca:ⁿn)			
775.	ca:ⁿn (cf. ca:ⁿd)	N_m	چاند	moon
776.	ci:ⁿn	N_m	چین	China
777.	cu:ⁿm	V_t	چوم	kiss
778.	co:ⁿc (cf. co:c)	N_f	چونچ	beak
779.	cɛ:ⁿn	N_f	چین	chain
780.	cɛ:ⁿn	N_m	چین	relief, peace
781.	cɔ:k	V_i	چوک (چونک)	be startled, be astonished
782.	cʰAp	V_i	چھپ	be printed, be published
783.	cʰAb	N_f	چھب	beauty, grace, charm
784.	cʰAt	N_f	چھت	roof; ceiling
785.	cʰAT	N_m	چھٹ	sixth day of a lunar fortnight; name of a Hindu festival
786	cʰAT	V_i	چھٹ	be picked out, be dispersed
787.	cʰAk	V_i	چھک	be tricked, be deceived
788.	cʰAR	N	چھڑ	shaft, staff, rod
789.	cʰIp (cf. cʰUp)	V_i	چھپ	be hidden
790.	cʰIl	V_i	چھل	be peeled, be husked
791.	cʰUp (cf. cʰIp)	V_i	چھپ	be hidden, be concealed
792.	cʰUT (cf. cʰu:T)	V_i	چھٹ	be set free
793.	cʰAⁿm	N_f	چھم	tinkle
794.	cʰAⁿn	V_i	چھن	be filtered
795.	cʰIⁿn	V_i	چھن	be snatched, be seized, be wrested

796.	$c^ha:$	V_t/V_t	چھا	cover; overcast, overshadow
797.	$c^ha:p$	N_f	چھاپ	stamp, print; impression
798.	$c^ha:p$	V_t	چھاپ	print, publish
799.	$c^ha:T$ (cf. $c^ha:^nT$)	V_t	چھاٹ	pick out; trim, prune
800.	$c^ha:c$ (cf. $c^ha:^nc$)	N_f	چھاج	buttermilk
801.	$c^ha:l$	N_f	چھال	skin; rind, peel; bark
802.	$c^hi:$	Intrj	چھی	shame!
803.	$c^hi:k$ (cf. $c^hi:^nk$)	N_f	چھیک	sneeze
804.	$c^hi:k$ (cf. $c^hi:k$)	V_t	چھیک	sneeze
805.	$c^hi:l$	V_t	چھیل	peel, husk
806.	$c^hu:$	V_t	چھو	touch, feel
807.	$c^hu:t$	N	چھوت	untouchable
808.	$c^hu:T$	N_f	چھوٹ	discount; liberty
809.	$c^hu:T$ (cf.c^hUT)	V_t	چھوٹ	be set free, be separated
810.	$c^he:$ (cf. $c^h\supset:$)	Adj	چھے	six
811.	$c^he:d$	N_m	چھید	hole, opening
812.	$c^he:d$	V_t	چھید	make a hole; bore, pierce
813.	$c^he:k$	V_t	چھیک	interrupt; detain
814.	$c^he:R$	N_f	چھیڑ	irritation, annoyance
815.	$c^he:R$	V_t	چھیڑ	tease, molest, disturb
816.	$c^ho:r$	N_m	چھور	border, edge
817.	$c^ho:R$	V_t	چھوڑ	leave; release
818.	$c^h\supset:$ (cf. $c^he:$)	Adj	چھو	six
819.	$c^ha:^nT$	V_t	چھانٹ	pick out; trim,

	(cf. $c^ha:T$)			prune
820.	$c^ha:^nc$ (cf. $c^ha:c$)	N_f	چھانچ (چھاچھ)	buttermilk
821.	$c^ha:^nn$	V_t	چھان	filter
822.	$c^hi:^nT$	N_f	چھینٹ	spot, stain; aplash, splattering
823.	$c^hi:^nT$	V_t	چھینٹ	sprinkle, spray
824.	$c^hi:^nk$ (cf. $c^hi:k$)	N_f	چھینک	sneeze
825.	$c^hi:^nk$ (cf. $c^hi:k$)	V_t	چھینک	sneeze
826.	$c^hi:^nm$	V	چھین	snatch
827.	jAp	V_t	جپ	mutter prayers, repeat in a murmuring tone
828.	jAb	Conj	جب	when (relative)
829.	jAc	V_t	جچ	be examined, be evaluated
830.	jAj	N_m	جج	judge
831.	jAg	N_m	جگ	world
832.	jAg	N_m	جگ	jug
833.	jAg	V_t	جگ	be awake
834.	jAs	N_m	جس	celebrity, fame, renown
835.	jAʃn f~jAʃAn	N_m	جشن	celebration, festival
836.	jAl	N_m	جل	water
837.	jAl	V_t	جل	be burnt
838.	jAld	Adv	جلد	soon, quickly
839.	jAR	N_f	جڑ	root, origin, source
840.	jAR	V_t	جڑ	fix, stud
841.	jIs	Pron	جس	who, which, what (relative); obl. sg.
842.	jIld	N_f	جلد	skin; volume (of

				a book); binding (of a book)
843.	jUT	V_t	جٹ	unite, join; close
844.	jUrm	N_m	جرم	crime
845.	jUR	V_t	جڑ	be joined, be attached
846.	jA^{n}m	V_t	جم	suit; match
847.	jA^{n}m	V_t	جم	become firm; be frozen; have a firm hold
848.	jA^{n}n	N_m	جن	man, person; worker, laborer
849.	jA^{n}n	V_t	جن	bear (a child)
850.	jA^{n}ŋ (cf. jA^{n}ŋg)	N_f	جنگ	war, battle
851.	jA^{n}ŋg (cf. jA^{n}ŋ)	N_f	جنگ	war, battle
852.	jI^{n}n	N_m	جن	one of the Genii, a male fairy; an elf
853.	jI^{n}n	Pron	جن	who, which, what (relative); obl. pl.
854.	ja:	N_f	جا	place
855.	ja:	V_t	جا	go, depart; pass
856.	ja:T	N_m	جاٹ	Jat
857.	ja:g	V_t	جاگ	waken; be awake
858.	ja:l	N_m	جال	net, trap
859.	ji:	N_m	جی	life, soul, spirit, mind; heart
860.	ji:	V_t	جی	be alive; live
861.	ji:	Adv; Intrj	جی	yes; sir!, madam!
862.	ji:p	N_f	جیپ	jeep
863.	ji:b	N_f	جیب (جیبھ)	tongue
864.	ji:t	N_f	جیت	win, victory, conquest

865.	ji:t	V_t		جیت	win, conquer, succeed
866.	ju:	N_f		جو	river stream
867.	ju:s	N_m		جوس	juice
868.	je:b	N_f		جیب	pocket
869.	je:T	N_m	(جیٹھ)	جیٹ	second month of the Hindu calendar; husband's elder brother
870.	je:l	N		جیل	jail, prison
871.	jo:	Rel Pron		جو	who, which, what (relative)
872.	jo:t	V_t		جوت	plough, cultivate
873.	jo:k	N_m		جوک	joke
874.	jo:g	N_m		جوگ	addition, joining
875.	jo:ʃ	N_m		جوش	boiling; excitement
876.	jo:r (cf. zo:r)	N_m		جور	force, strength, pressure, powder
877.	jo:R	N_m		جوڑ	joint, connection
878.	jo:R	V_t		جوڑ	join, unite, attach together
879.	jɛ:	Adj		جے	as many as, as much as
880.	jɔ:	N_m		جو	barley; grain of barley
881.	ja:^{n}c	N_f		جانچ	examination, trial, investigation
882.	ja:^{n}c	V_t		جانچ	examine, test, evaluate
883.	ja:^{n}m	N_m		جام	guava; guava shaped water pot
884.	ja:^{n}m	N_m		جام	jam
885.	ja:^{n}n	N_f		جان	life, soul, vitality

886.	ja:ⁿn	V_t	جان	know
887.	ja:ⁿŋ (cf. ja:ⁿŋg)	N_f	جانگ (جانگھ)	thigh
888.	ja:ⁿŋg (cf. ja:ⁿŋ)	N_f	جانگ (جانگھ)	thigh
889.	ji:ⁿm	N_m	جیم	seventh letter of the Urdu alphabet
890.	ju:ⁿ	N_f	جوں	lice
891.	ju:ⁿn	N_m	جون	june
892.	jo:ⁿk	N	جونک	leech
893.	jʰAT	Adv	جھٹ.	quickly
894.	jʰAl	V_t	جھل	move (a fan) to and fro; swing, wave
895.	jʰAr	N_f	جھر.	heat
896.	jʰAR	V_i	جھڑ	drop, fall
897.	jʰUk	V_i	جھک	be bent down; lean; inclined
898.	jʰUⁿND	N_m	جھنڈ.	multitude, crowd, flock, herd
899.	jʰa:g	N_f	جھاگ	foam, froth; scum
900.	jʰa:l	N_m	جھال	pungency (as of pepper or chillies)
901.	jʰa:l	V_t	جھال	solder
902.	jʰa:R	N_m	جھاڑ	bush, shrub; tree
903.	jʰa:R	V_t	جھاڑ	sweep, clean; dust
904.	jʰi:l	N_f	جھیل.	pool, shallow lake
905.	jʰu:T	N_m	جھوٹ	lie, falsehood
906.	jʰu:l	V_i	جھول	hang down, dangle; swing, sway to and fro

907.	$j^hE:l$	V_t	جھیل	bear
908.	$j^ha:^np$	N_m	جھانپ	frame of bamboo; matting
909.	$j^ha:^np$	V_t/V_t	جھانپ	cover, hide, conceal
910.	$j^ha:^nT$	V_t	جھانٹ	pubic hair
911.	$j^ha:^nk$	V_t	جھانک	peep, look (through a hole or an opening)
912.	$j^ha:^ns$	N_m	جھانس	pungency (as of onion, pepper)
913.	$j^hu:^nm$	V_t	جھوم	shake, sway to and fro, wave; move with stately steps
914.	$j^he:^np$	N_f	جھینپ	shyness
915.	$j^he:^np$	V_t	جھینپ	be shy
916.	$j^ho:^nk$	N_f	جھونک	inclination; impulse
917.	$j^ho:^nk$	V_t	جھونک	throw; set fire to
918.	kAp	N_m	کپ	cup
919.	kAb	Adv	کب	when
920.	kAT	V_t	کٹ	be cut
921.	kAc	N_m	کچ	the water in which raw rice has been washed
922.	kAf	N_m	کف	phlegm, spittle, mucus
923.	kAf	N	کف	palm (of the hand); the hand
924.	kAs	V_t	کس	tighten
925.	kAʃ	N_m	کش	puff
926.	kAl	N_m	کل	parts, tools
927.	kAl	N_f	کل	side, flank
928.	kAl	Adv	کل	tomorrow; yesterday

929.	kAlb	N_m	کلب	dog
930.	kAr	V_t	کر	do; perform
931.	kArg	N_m	کرگ	rhinoceros
932.	kAR (cf. kAR^h)	V_i	کڑ	be embroidered
933.	kAR^h (cf. kAR)	V_i	کڑھ	be embroidered
934.	kIs	Pron	کس	who, what (interrog.); obl. sg.
935.	kUT	N_f	کٹ	cracking of hens
936.	kUc	N_m	کچ	tortoise, turtle
937.	kUc (cf. kUc^h)	Adj	کچ	few
938.	kUc	N_m/N_f	کچ	female breast teat, nipple
939.	kUc^h (cf. kUc; ku:c)	Adj	کچھ	few
940.	kUl	Adj	کل	total, sum, whole, all, entire
941.	kUR	V_i	کڑ (کڑھ)	be annoyed, be disgusted
942.	kA^{n}m	Adj	کم	few, less
943.	kI^{n}n	Pron	کن	who, what (interrog.); obl. pl.
944.	kU^{n}nd	Adj	کند	blunt
945.	ka: (cf. ki:; ke:)	Postp	کا	of, belonging to
946.	ka:p (cf. ka:^{n}p)	V_i	کاپ	tremble, shake
947.	ka:b (cf. xa:b)	N_m	کاب (قاب)	large plate
948.	ka:t	V_t	کات	spin (cotton or thread)
949.	ka:T	N_m	کاٹ	solution, answer
950.	ka:T	N_m	کاٹ (کاٹھ)	wood, timber

951.	ka:T	V_t	کاٹ	cut; bite
952.	ka:D	N_m	کاڈ	card
953.	ka:c (cf. ka:^{n}c)	N_m	کاچ	glass; mirror
954.	ka:c (cf. ka:c^{h})	N_m	کاچ	the upper part of the thigh; the buttocks
955.	ka:c^{h} (cf. ka:c)	N_m	کاچھ	the upper part of the thigh; the buttocks
956.	ka:j	N_m	کاج	button hole
957.	ka:j	N_m	کاج	work
958.	ka:k	N_m	کاک	dry or hard bread, sweetened cake of bread
959.	ka:g	N_m	کاگ	crow
960.	ka:f	N_m	کاف	twenty-eighth letter of the Urdu alphabet
961.	ka:ʃt	N_f	کاشت	cultivation, planting
962.	ka:l	N_m	کال	inauspicious time; famine
963.	ka:r	N_f	کار	car
964.	ka:r	N_m	کار	work
965.	ka:R (cf. ka:R^{h})	V_t	کاڑ	embroider
966.	ka:R^{h} (cf. ka:R)	V_t	کاڑھ	embroider
967.	ki: (cf. ka:)	Postp	کی	of, belonging to
968.	ki:c	N_f	کیچ	mud
969.	ki:f (cf. xi:f)	N	کیف (قیف)	funnel
970.	ki:l	N_m	کیل	nail, peg
971.	ki:l	N_f	کیل	key
972.	ku:d	V_t	کود	jump, leap

973.	ku:T	V_t	کوٹ	smash, crush (into powder)
974.	ku:c	N	کوچ	departure; decamping
975.	ku:c (cf. kUc^h)	Adj	کوچ (کچھ)	few
976.	ku:k	N_f	کوک	shriek (of a human being, or of a peacock or cuckoo, etc.)
977.	ku:k	V_t	کوک	cry (as of the Indian cuckoo)
978.	ke: (cf. ka:)	Postp	کے	of, belonging to
979.	ke:k	N_m	کیک	cake
980.	ke:s	N_m	کیس	hair
981.	ke:s	N_m	کیس	case
982.	ko:	Postp	کو	to; for
983.	ko:T	N_m	کوٹ	coat
984.	ko:T	N_m	کوٹ	court
985.	ko:c	N_m	کوچ	coach
986.	ko:c	V_t	کوچ	thrust (in), drive (in); push, stuff
987.	ko:k	N_f	کوک	womb
988.	ko:ft	N_f	کوفت	anguish, irritation
989.	ko:s	V_t	کوس	curse
990.	ko:s	N_m	کوس	unit of distance (equal to about 2.5 kms.)
991.	ko:r	N_m	کور	edge, border
992.	ko:R (cf. ko:R^h)	N_m	کوڑ	leprosy
993.	ko:R^h (cf. ko:R)	N_m	کوڑھ	leprosy
994.	kɛ:	V_t	کۓ (کہ)	say, utter
995.	kɛ:	Adj	کۓ	how many, how

				much
996.	kɛ:p	N_f	کیپ	cap
997.	kɛ:f	N_m	کیف	intoxication
998.	kya:	Pron	کیا	what (interrogative)
999.	ka:^{n}	Adv	کاں(کہاں)	where (interrogative)
1000.	ka:^{n}p (cf. ka:p)	V_i	کانپ	shiver; tremble
1001.	ka:^{n}d	N_f	کاند	wall; embankment
1002.	ka:^{n}c (cf. ka:c)	N_m	کانچ	glass; mirror
1003.	ka:^{n}m	N_m	کام	work
1004.	ka:^{n}n	N_f	کان	ear
1005.	ka:^{n}n	N_f	کان	mine
1006.	ko:^{n}m	N_f	کوم	tip of the plant or shrub
1007.	ko:^{n}n (cf. kɔ:^{n}n)	Pron	کون	who (interrogative)
1008.	kɛ:^{n}mp	N_m	کیمپ	camp
1009.	kɔ:^{n}n (cf. ko:^{n}n)	Pron	کون	who (interrogative)
1010.	k^{h}Ap	V_i	کھپ	be matched; be absorbed
1011.	k^{h}AT	N_m	کھٹ	body
1012.	k^{h}AT	N_m	کھٹ	sound of knocking
1013.	k^{h}Al	V_i	کھل	be fed up, be annoyed
1014.	k^{h}IT	N_f	کھٹ	spot; dirt, filth
1015.	k^{h}Ic	V_i	کھچ	be pulled
1016.	k^{h}Il	V_i	کھل	bloom, flower
1017.	k^{h}Ud	V_i	کھو	be dug
1018.	k^{h}Ul	V_i	کھل	be opened

1019.	k^hUr	N_m	کھر	cloven, hoof
1020.	k^hA^nm	N_m	کھم	pillar
1021.	k^hA^nn	N_m	کھن	sky
1022.	k^hA^nn	N_f	کھن	clink, tinkle
1023.	$k^ha:$	V_t	کھا	eat
1024.	$k^ha:d$	N_f	کھاد	fertilizer
1025.	$k^ha:T$	N_f	کھاٹ	cot, charpoy
1026.	$k^ha:s$ (cf. $k^ha:^ns$)	V_t	کھاس	cough
1027.	$k^ha:l$	N_f	کھال	skin
1028.	$k^hi:c$ (cf. $k^hi:^nc$)	V_t	کھچ	pull
1029.	$k^hi:r$	N_f	کھیر	dish made of rice, milk and sugar
1030.	$k^he:p$	N_m	کھیپ	single time; periodical supply
1031.	$k^he:t$	N_m	کھیت	field (agricultural); farm
1032.	$k^he:l$	N_m	کھیل	play, game
1033.	$k^he:l$	V_t	کھیل	play
1034.	$k^ho:$	N	کھو (کھوہ)	cave
1035.	$k^ho:$	V_i/V_t	کھو	lose; part with
1036.	$k^ho:d$	V_t	کھود	dig
1037.	$k^ho:T$	N	کھوٹ	deceit, fraud; defect
1038.	$k^ho:c$ (cf. $k^ho:^nc$)	N_m	کھوچ	scratch
1039.	$k^ho:j$	N_f	کھوج	discovery, search
1040.	$k^ho:j$	V_t	کھوج	search, explore
1041.	$k^ho:s$	V_t	کھوس	insert (into)
1042.	$k^ho:l$	V_t	کھول	open
1043.	$k^ho:R$	N_f	کھوڑ	defect; disease;

				unlucky moment
1044.	$k^h ɔ:l$	V_t	کھول	boil
1045.	$k^h a:^n D$	N	کھانڈ	raw sugar, molasses
1046.	$k^h a:^n n$ (cf. $ka:^n n$)	N_f	کھان	cave; mine
1047.	$k^h a:^n s$ (cf.$k^h a:s$)	V_t	کھانس	cough
1048.	$k^h i:^n c$ (cf. $k^h i:c$)	V_t	کھینچ	pull
1049.	$k^h o:^n c$ (cf. $k^h o:c$)	N_m	کھونچ	scratch
1050.	gAp	N_f	گپ	idle talk, gossip
1051.	gAt	N	گت	state, condition
1052.	gAT	N_m	گٹ	sound of gulping
1053.	gAc	V_t	گچ (گچھ)	agree
1054.	gAz	N_m	گز	yard
1055.	gAʃ (cf. γAʃ)	N_m	گش	swoon, insensibility, fainting
1056.	gAʃt	N_f	گشت	vigil; roam; stroll
1057.	gAl	V_t	گل	be boiled
1058.	gAr	V_i	گر	be squeezed; be extracted
1059.	gAr	Conj	گر	if
1060.	gArd f-gArAd	N_f	گرد	dust
1061.	gAR (cf. gAR^h)	N	گڑ	fort, castle
1062.	gAR	V_t	گڑ	penetrate, pierce
1063.	gAR^h (cf. gAR)	N	گڑھ	fort, castle
1064.	gId	N_m	گد (گدھ)	vulture
1065.	gIl	N_f	گل	soil, clay

1066.	glr	V_i	گر	fall, drop
1067.	glrd	Adj	گرد	near, close
1068.	gUt	V_t	گت (گتھ)	thread, plait
1069.	gUl	N_m	گل	flower
1070.	gUl	Pred Adj	گل	put out; snuff (of a lamp or a candle)
1071.	gUR	N_m	گڑ	raw sugar, molasses
1072.	gA^{n}n	N_m	گن	gun
1073.	gA^{n}nd	N_f	گند (گندھ)	odor, smell
1074.	gA^{n}ñj	N_m	گنج	market; town
1075.	gI^{n}n	V_t	گن	count
1076.	gU^{n}m	Pred Adj	گم	lost
1077.	gU^{n}n	N_m	گن	attribute, quality
1078.	gU^{n}nd	V_i	گند (گندھ)	be kneaded
1079.	ga:	V_t	گا	sing
1080.	ga: (cf. gi:,ge:)	Fut Aux	گا	will, shall; masc. sg.
1081.	ga:b	Pred Adj	گاب (گابھ)	pregnant (animal)
1082.	ga:D	N_m	گاڈ	guard
1083.	ga:f	N_m	گاف	twenty-ninth letter of the Urdu alphabet
1084.	ga:l	N_m	گال	cheek
1085.	ga:r (cf. ɣa:r)	N_f	گار	cave
1086.	ga:r	V_t	گار	sqeeze; extract
1087.	ga:R	V_t	گاڑ	bury
1088.	gi: (cf. ga:)	Fut Aux	گی	will, shall; fem.
1089.	gi:t	N_m	گیت	song
1090.	gu:	N_m	گو	human

				excrement
1091.	gu:t	V_t	گوت (گوتھ)	thread, plait
1092.	ge: (cf. ga:)	Fut Aux	گے	will, shall; masc. pl.
1093.	ge:T	N_m	گیٹ	gate
1094.	go:t	N_m	گوت	family, kith and kin
1095.	go:d	N_f	گود	lap
1096.	go:T	N_f	گوٹ	a piece, a counter (at chess etc.)
1097.	go:ʃ	N_f	گوش	ear
1098.	go:ʃ (cf. go:ʃt)	N_m	گوش	meat, flesh
1099.	go:ʃt (cf. go:ʃ)	N_m	گوشت	meat, flesh
1100.	go:l	Adj	گول	round, circular
1101.	go:r	N_f	گور	grave
1102	go:R	V_t	گوڑ	dig; scrap, scratch
1103.	gɛ:p	N_m	گیپ	gap
1104.	gɛ:s	N_f	گیس	gas
1105.	gɔ:	N_f	گو	cow
1106.	ga:^{n}T (cf. ga:^{n}T^{h})	N_f	گانٹ	knot, bundle
1107.	ga:^{n}T^{h} (cf. ga:^{n}T)	N_f	گانٹھ	knot, bundle
1108.	ga:^{n}D (cf. ga:^{n}R)	N_f	گانڈ	anus
1109.	ga:^{n}m	N	گام	footstep, step
1110.	ga:^{n}R (cf. ga:^{n}D)	N_f	گانڑ	anus
1111.	gi:^{n}j	V_t	گینج	mash with the hand
1112.	gu:^{n}d	V_t	گوند (گوندھ)	knead

1113.	gu:ⁿj	V_i	گونج	echo, hum
1114.	ge:ⁿd	N_f	گیند	ball
1115.	go:ⁿd	N_m	گوند	gum
1116.	gɛ:ŋ (cf. gɛ:ŋg)	N_m	گینگ	gang
1117.	gɛ:ŋg (cf. gɛ:ŋ)	N_m	گینگ	gang
1118.	gʰAT	V_i	گھٹ	lessen, decrease
1119.	gʰAT	Adv	گھٹ	hold firmly
1120.	gʰAs (cf. gʰIs)	V_t	گھس	grind
1121.	gʰAr	N_m	گھر	house
1122.	gʰIs (cf. gʰAs)	V_t	گھس	grind
1123.	gʰIr	V_i	گھر	be surrounded, be encircled
1124.	gʰUp	Adj	گھپ	dark
1125.	gʰUT	V_i	گھٹ	be suffocated, be pounded; be blended
1126.	gʰUs	V_i	گھس	enter forcibly
1127.	gʰUl	V_i	گھل	be dissolved
1128.	gʰIⁿn	N_f	گھن	hatred, dislike
1129.	gʰUⁿm	V_i	گھم	be revolved; be moved
1130.	gʰUⁿn	N	گھن	weevil
1131.	gʰa:t	N_m	گھات	dangerous attack
1132.	gʰa:T	N_f	گھاٹ	bank of a river; wharf
1133.	gʰa:s (cf. gʰa:ⁿs)	N_f	گھاس	grass, straw
1134.	gʰa:l	V_t	گھال	trap, entangle
1135.	gʰi:	N_m	گھی	ghee: clarified butter
1136.	gʰu:T	N	گھوٹ	gulp

	(cf. $g^hu:^nT$)			
1137.	$g^hu:T$ (cf. $g^hu:^nT$)	V_t	گھوٹ	gulp
1138.	$g^hu:s$	N	گھوس	bribe
1139.	$g^hu:r$	V_t	گھور	stare at
1140.	$g^he:g$	N_m	گھیگ	goitre
1141.	$g^he:ɽ$	N_m	گھیر	circumference
1142.	$g^he:r$	V_t	گھیر	encircle, surround
1143.	$g^ho:T$	V_t	گھوٹ	grind, press, squeeze, choke
1144.	$g^ho:l$	N_m	گھول	solvent, solution
1145.	$g^ho:l$	V_t	گھول	mix, dissolve
1146.	$g^ha:^ns$ (cf. $g^ha:s$)	N_f	گھانس	grass, straw
1147.	$g^hu:^nT$ (cf.$g^hu:T$)	N	گھونٹ	gulp
1148.	$g^hu:^nT$ (cf. $g^hu:T$)	V_t	گھونٹ	gulp
1149.	$g^hu:^nm$	V_t	گھوم	wander; turn, revolve
1150.	mAt	N_f	مت	wisdom, mind
1151.	mAt	Neg Adv	مت	do not
1152.	mAd	N_m	مد	diacritical mark placed over 'alif'
1153.	mAd	N_m	مد	wine
1154.	mAc	V_i	مچ	be raised (noise)
1155.	mAg	N_m	مگ	mug
1156.	mAst	Adj	مست	intoxicated, excited
1157.	mAʃk	N_f	مشک	water pot
1158.	mAʃk	N_f	مشک(مشق)	excercise
1159.	mAl	V_t	مل	rub
1160.	mAr	V_i	مر	die
1161.	mArd	N_m	مرد	man

	f~mArAd			
1162.	mArz f~ mArAz	N_m	مرض	disease
1163.	mAR	V_t	مڑ(مڑھ)	cover (as a book etc. with cloth, leather)
1164.	mIT	V_i	مٹ	be erased
1165.	mIl	V_i	مل	be available; mix, meet
1166.	mIl	N_m	مل	mill
1167.	mUrg (cf. mUrɣ)	N_m	مرگ	chiken
1168.	mUrɣ (cf. mUrg)	N_m	مرغ	chiken
1169.	mUR	V_i	مڑ	be turned; be bent
1170.	mUR (cf. mU^{n}ND)	V_i	مڑ	be shaved
1171.	mA^{n}j	V_i	منج	be cleaned
1172.	mA^{n}n	N_m	من	heart, mind
1173.	mA^{n}n	N_m	من	measure of weight
1174.	mU^{n}ND (cf. mUR)	V_i	منڈ	be shaved
1175.	ma: (cf. ma:^{n})	N_f	ما	mother
1176.	ma:t	N_f	مات	defeat
1177.	ma:T	N_m	ماٹ	large earthen vessel or jar
1178.	ma:T (cf. ma:T^h)	N_f	ماٹ(ماٹھ)	a species of pot-herb or vegetable, Amaranthus oleraceus
1179.	ma:T^h (cf. ma:T)	N_f	ماٹھ	a species of pot-herb or vegetable, Amaranthus oleraceus
1180.	ma:g	N_m	ماگ	road

1181.	ma:g	N_m	ماگ (ماگھ)	eleventh month of the Hindu calendar
1182.	ma:f (cf. ma:^{n}f)	Pred Adj	ماف (معاف)	forgive
1183.	ma:ʃ	N_f	ماش	kind of pulse
1184.	ma:l	N_m	مال	wealth
1185.	ma:r	N	مار	wound
1186.	mi:t	N_m	میت	fiance, fiancee
1187.	mi:T	N_m	میٹ	meat
1188.	mi:c	V_t	میچ	shut or close (the eyes)
1189.	mi:l	N_m	میل	mile
1190.	mi:r	N_m	میر	Mir: title assumed by the Saiyids
1191.	mu:t	N_m	موت	urine
1192.	mu:t	V_t	موت	urinate
1193.	mu:D	N_m	موڈ	mood
1194.	me:g	N_m	میگ	cloud
1195.	me:z	N_f	میز	table
1196.	me:x	N_f	میخ	nail
1197.	me:l	N_m	میل	union, reconciliation; meeting
1198.	mo:c (cf. mo:^{n}c)	N	موچ	stain
1199.	mo:r	N_m	مور	peacock
1200.	mo:R	N_m	موڑ	turn, twist
1201.	mo:R	V_t	موڑ	turn, twist
1202.	mɛ:	N_f	مے	wine
1203.	mɛ:c	N_m	میچ	match
1204.	mɛ:l	N_m	میل	filth, dirt
1205.	mɛ:l	N_m	میل (محل)	palace

1206	mɔ:t	N.	موت	death
1207.	mɔ:j	N.	موج	wave; ecstacy
1208.	mɔ:s	N	موس	banana
1209.	ma:ⁿ (cf. ma:)	N_f	ماں	mother
1210.	ma:ⁿn	N	مان	den (of a wild beast)
1211.	ma:ⁿn	V_t	مان	respect; believe; admit, acknowledge
1212.	ma:ⁿŋ (cf. ma:ⁿŋg)	N_f	مانگ	hair-parting
1213.	ma:ⁿŋ (cf. ma:ⁿŋg)	N_f	مانگ	demand
1214.	ma:ⁿŋ (cf. ma:ⁿŋg)	V_t	مانگ	beg, ask
1215.	ma:ⁿŋg (cf. ma:ⁿŋ)	N_f	مانگ	hair-pairting
1216.	ma:ⁿŋg (cf. ma:ⁿŋ)	N_f	مانگ	demand
1217.	ma:ⁿŋg (cf. ma:ⁿŋ)	V_t	مانگ	beg, ask
1218.	ma:ⁿf (cf. ma:f)	Pred Adj	ماف (معاف)	forgive
1219.	mi:ⁿm	N_m	میم	thirty-first letter of the Urdu alphabet
1220.	mu:ⁿ	N_m	موں (منہ)	mouth, face
1221.	mu:ⁿd	V_t	موند	close
1222.	mu:ⁿc (cf. mu:ⁿcʰ)	N_f	مونچ	moustache
1223.	mu:ⁿcʰ (cf. mu:ⁿc)	N_f	مونچھ	moustache
1224.	mu:ⁿŋ (cf. mu:ⁿŋg)	N_f	مونگ	kind of pulse
1225.	mu:ⁿŋg (cf. mu:ⁿŋ)	N_f	مونگ	kind of pulse
1226.	me:ⁿ	Postp	میں	in, into

1227.	mo:^{n}c (cf. mo:c)	N	مونچ (موچ)	stain
1228.	mo:^{n}m	N_m	موم	vax
1229.	mɛ:^{n}	Pers Pron	میں	I
1230.	nAp	V_t	نپ	be measured
1231.	nAbz f~nAbAz	N_m	نبض	pulse, vein
1232.	nAt (cf. nAt^{h})	N_f	نت	nose-ring
1233.	nAt^{h} (cf. nAt)	N_f	نتھ	nose-ring
1234.	nAg	N_m	نگ	jewel or stone of a ring
1235.	nAfs f~nAfAs	N_m	نفس	soul, self
1236.	nAs (cf. nA^{n}s)	N_f	نس	vein, nerve
1237.	nAxʃ	N_m	نخش (نقش)	painting, carving
1238.	nAxl f~nAxAl	N_f	نخل (نقل)	imitation, copy
1239.	nAl	N_m	نل	tap, pipe
1240.	nAr	N_m	نر	masculine; male
1241.	nArs	N_f	نرس	nurse
1242.	nArm f~nArAm	Adj	نرم	soft
1243.	nIb	N	نب	nib
1244.	nIb	V_t	نب (نبھ)	be carried on; be managed
1245.	nUxs f~nUxAs	N_m	نخس (نقص)	defect, deficiency
1246.	nA^{n}m	Adj	نم	moist, wet
1247.	nA^{n}n	N_f	نن	nun
1248.	nA^{n}nd	N_f	نند	husband's sister
1249.	nA^{n}s (cf. nAs)	N_f	نس	vein, nerve
1250.	nU^{n}c	V_t	نچ	be scratched; be

				plucked
1251.	na: (cf. na:^{n})	Neg Adv	نا	no, not
1252.	na:p	N_m	ناپ	measurement
1253.	na:p	V_t	ناپ	measure, weigh
1254.	na:t	N_f	نعت	poem in praise of the Prophet
1255.	na:d	N_m	ناد	large open-mouthed water-jar or trough
1256.	na:T	N_m	ناٹ	wooden support (of a hut); pillar
1257.	na:c (cf. na:^{n}c)	N_m	ناچ	dance
1258.	na:c (cf. na:^{n}c)	V_i	ناچ	dance
1259.	na:k (cf. na:^{n}k)	N_f	ناک	nose
1260.	na:g	N_m	ناگ	hooded snake; cobra
1261.	na:f	N_f	ناف	navel
1262.	na:s	N_m	ناس	loss, destruction
1263.	na:z	N_m	ناز	pride
1264.	na:ʃ	N_f	نعش	dead body, corpse
1265.	na:l	N_f	نال	barrel
1266.	na:l	N_f	نال (نعل)	horse-shoe
1267.	na:r	N_m	نار	young of a paddy plant
1268.	na:r	N_f	نار	fire; hell-fire
1269.	ni:c	Adj	نیچ	mean, low
1270.	nu:r	N_m	نور	light; illumination
1271.	ne:k	Adj	نیک	honest, holy, virtuous
1272.	no:T (cf. no:^{n}T)	N_m	نوٹ	note; paper money

1273.	no:c (cf. no:ⁿc)	V_t	نوچ	scratch
1274.	no:k (cf. no:ⁿk)	N_f	نوک	point, tip
1275.	no:ʃ	Pred Adj	نوش	eating; drinking
1276.	nɔ: (cf. nɔ:ⁿ)	Adj	نو	new
1277.	nɔ: (cf. nɔ:ⁿ)	Adj	نو	nine
1278.	na:ⁿ (cf. na:)	Neg Adv	ناں	no, not
1279.	na:ⁿc (cf. na:c)	N_m	نانچ	dance, twist
1280.	na:ⁿc (cf. na:c)	V_t	نانچ	dance
1281.	na:ⁿk (cf. na:k)	N_f	نانک	nose
1282.	na:ⁿm	N_m	نام	name
1283.	na:ⁿn	N_f	نان	bread
1284.	ni:ⁿb (cf. ni:ⁿm)	N_m	نیب (نیم)	the neem-tree, melia azadirachta
1285.	ni:ⁿd (cf. ni:ⁿn)	N_f	نیند	sleep
1286	ni:ⁿm	N_m	نیم	the neem-tree, melia azadirachta
1287.	ni:ⁿm	Adj	نیم	half, partial
1288.	ni:ⁿn (cf. ni:ⁿd)	N_f	نین	sleep
1289.	ni:ⁿl	N_m	نیل	dark blue color
1290.	nu:ⁿ	N_m	نوں	thirty-second letter of the Urdu alphabet
1291.	nu:ⁿ	N_m	نوں (نوح)	Noah
1292.	no:ⁿT (cf. no:T)	N_m	نونٹ	note; paper money
1293.	no:ⁿc	V_t	نونچ	scratch

	(cf. no:c)			
1294.	no:^{n}k (cf. no:k)	N_f	نونک	point, tip
1295.	nɛ:^{n}n	N_f	نین	eyes
1296.	nɔ:^{n} (cf. nɔ:)	Adj	نوں	nine
1297.	nɔ:^{n} (cf. nɔ:)	Adj	نوں	new
1298.	fAsT	Adj	فسٹ	first
1299.	fAx	Pred Adj	فخ (فق)	lost (as color from the face); blank
1300.	fAr	N_m	فر	beauty, elegance, grace
1301.	fArd	N_m	فرد	person, sole
1302.	fArz	Nm; Adj	فرض	duty, obligation
1303.	fArʃ f~ArAʃ	N_m	فرش	floor
1304.	fArx f~fArAx	N_m	فرخ (فرق)	difference, distinction
1305.	fA^{n}n	N_m	فن	skill
1306.	fA^{n}nd	N_m	فند	artifice, decceit, fraud
1307.	fa:ʃ	Pred Adj	فاش	known, apparent
1308.	fa:l	N_m	فال	omen, augury
1309.	fa:l	N_m	فال	fall of a Sari
1310.	fi:	Prep	فی	each, per
1311.	fi:s	N_f	فیس	fee
1312.	fe:	N_m	فے	twenty-sixth letter of the Urdu alphabet
1313.	fe:l	N_m	فعل	deed, action
1314.	fe:l	Pred Adj	فیل	fail
1315.	fɛ:z	N_m	فیض	beneficence, bounty

1316.	fɔ:t	N_f	فوت	death
1317	fɔ:j	N_f	فوج	army
1318.	fo:^{n}m	N_m	فوم	foam
1319.	fɔ:^{n}m	N_m	فوم	form
1320.	vAjd	Adj	وجد	ecstacy
1321.	vAst	N	وسط	middle
1322.	vAsl	N_m	وصل	union
1323.	vAxt f~vAxAt	N_m	وخت(وقت)	time
1324.	vAld	N	ولد	son of
1325.	va:z	N_m	وعظ	sermon
1326.	va:r	N_m	وار	attack
1327.	vo: (cf. wo:)	Pron	وو(وہ)	he, she, it (remote dem.)
1328.	va:^{n} (cf. wa:^{n})	Pron	واں (وہاں)	there (remote dem.)
1329.	vɛ:^{n}m	N_m	وہم	superstition
1330.	sAb	Adj	سب	all
1331.	sAbz	Adj	سبز	green
1332.	sAbr (f~sAbAr)	N_m	صبر	patience, endurance, self-restraint
1333.	sAT	V_i	سٹ	stick, adhere
1334.	sAc	N_m	سچ	truth
1335.	sAj	V_i	سج	be decorated; be made ready
1336.	sAf	N_f	صف	rank; row, line
1337.	sAk	V_i	سک	be able
1338.	sAxt f~sAxAt	Adj	سخت	hard, strict
1339.	sAr (cf. sIr)	N_m	سر	head, top
1340.	sAr	N	سر	sir
1341.	sAR	V_i	سڑ	decay

1342.	sIc	V_i	سچ	be irrigated
1343.	sIk (cf. sIk^h)	N_m	سک	Sikh
1344.	sIk	V_i	سک	be warmed, be heated; be roasted
1345.	sIk^h (cf. sIk)	N_m	سکھ	Sikh
1346.	sIl	N_f	سل	flat stone on which spices are ground with a muller
1347.	sIl	V_i	سل	be sewn
1348.	sIr (cf. sAr)	N_m	سر	head, top
1349.	sUb	N_f	سب(صبح)	morning, daybreak
1350.	sUk (cf. sUk^h)	N_m	سک	pleasure, comfort
1351.	sUk^h (cf. sUk)	N_m	سکھ	pleasure, comfort
1352.	sUst	Adj	سست	lazy, dull
1353.	sUr	N_m	سر	tone, tune; lost in one's thought
1354.	sA^{n}n	N	سن	year, age or period
1355.	sA^{n}n	N_f	سن	jute
1356.	sA^{n}n	V_i	سن	be smeared
1357.	sA^{n}ŋ (cf.sA^{n}ŋg)	N_m	سنگ	stone
1358.	sA^{n}ŋ (cf. sA^{n}ŋg)	Postp	سنگ	together, in company
1359.	sA^{n}ŋg (cf. sA^{n}ŋ)	N_m	سنگ	stone
1360.	sA^{n}ŋg (cf.sA^{n}ŋ)	Postp	سنگ	together, in company
1361.	sI^{n}n	N_m	سن	age
1362.	sU^{n}n	V_i	سن	hear, listen

1363.	sU^{r}n	Pred Adj	سن	senseless, numb
1364.	sa: (cf. si:,se:)	Encl Pcl	سا	like, resembling; masc. sg.
1365.	sa:b	N_m	ساب (صاحب)	mister, sir
1366.	sa:t	Adj	سات	seven
1367.	sa:t (cf. sa:t^{h})	Postp	سات	together, alongwith
1368.	sa:t^{h} (cf. sa:t)	Postp	ساتھ	together, alongwith
1369.	sa:d	N_m	ساد	twentieth letter of the Urdu alphabet
1370.	sa:T (cf. sa:T^{h})	Adj	ساٹ	sixty
1371.	sa:T	V_i/V_t	ساٹ	stick, join
1372.	sa:T^{h} (cf. sa:T)	Adj	ساٹھ	sixty
1373.	sa:f	Adj	صاف	clean
1374.	sa:s	N_f	ساس	mother-in-law
1375.	sa:z	N_m	ساز	music
1376.	sa:l	N_m	سال	year
1377.	si:	V_t	سی	sew, stitch
1378.	si: (cf. sa:)	Encl Pcl	سی	like, resembling; fem.
1379.	si:p	N_f	سیپ	oyster-shell
1380.	si:d (cf. si:d^{h})	N_f	سید	straight line; crease
1381.	si:d^{h} (cf. si:d)	N_f	سیدھ	straight line; crease
1382.	si:T	N_f	سیٹ	seat
1383.	si:k (cf. si:k^{h})	V_t	سیک	learn
1384.	si:k^{h} (cf. si:k)	V_t	سیکھ	learn
1385.	si:x	N_m	سیخ	skewer
1386.	su:p	N_m	سوپ	flat basket (for

				winnowing)
1387.	su:p	N_m	سوپ	soup
1388.	su:t	N_m	سوت	cotton thread
1389.	su:d	N_m	سود	interest; usury
1390.	su:T	N_m	سوٹ	suit
1391.	su:j	V_i	سوج	swell
1392.	su:j (cf. su:j^h)	V_i	سوج	be seen
1393.	su:j^h (cf. su:j)	V_i	سوجھ	be seen
1394.	su:k (cf. su:k^h)	V_i	سوک	dry; become dry
1395.	su:k^h (cf. su:k)	V_i	سوکھ	dry; become dry
1396.	su:r	N_m	صور	trumpet blown on the day of resurrection
1397.	se:	N_m	سے	sixth letter of the Urdu alphabet
1398.	se:	V_t	سے	sit on (eggs); hatch
1399.	se:	Postp	سے	from
1400.	se: (cf. sa:)	Encl Pcl	سے	like, resembling; mase. pl.
1401.	se:b	N_m	سیب	apple
1402.	se:T (cf. se:T^h)	N	سیٹ	businessman; banker
1403.	se:T^h (cf. se:T)	N	سیٹھ	businessman; banker
1404.	se:j	N	سیج	decorated bed; couch
1405.	se:k	V_t	سیک	warm, heat; roast
1406.	se:r	N_m	سیر	seer: measure of weight slightly less than kilogram

1407.	so:	V_i	سو	sleep
1408.	so:T (cf. so:ⁿT)	N_f	سوٹ (سونٹھ)	dry ginger
1409.	so:c	N_f	سوچ	thought, imagination
1410.	so:c	V_t	سوچ	think, imagine
1411.	so:k	V_t	سوک (سوکھ)	soak, absorb
1412.	so:g	N_m	سوگ	sorrow, grief, mourning
1413.	so:z	N_m; Adj	سوز	a stanza of a marsia or elegiac poem; ardent, painful
1414.	sɛ:	V_t	سے	bear, tolerate
1415.	sɛ:r	N_f	سیر	morning walk; sight-seeing
1416.	sɔ:	Adj	سو	hundred
1417.	sɔ:t	N_f	سوت	co-wife; contemporary wife
1418.	sa:ⁿp	N_m	سانپ	snake
1419.	sa:ⁿt	N_f	سانت	season of spring; rainy season
1420.	sa:ⁿD (cf. sa:ⁿR)	N_m	سانڈ	bull
1421.	sa:ⁿj	N_f	سانج (سانجھ)	evening
1422.	sa:ⁿn	V_t	سان	mix up, mash
1423.	sa:ⁿs	N_f	سانس	breath
1424.	sa:ⁿR (cf. sa:ⁿD)	N_m	سانڑ (سانڈ)	bull
1425.	si:ⁿc	V_t	سینچ	irrigate
1426.	si:ⁿn	N_m	سین	eighteenth letter of the Urdu alphabet
1427.	si:ⁿŋ (cf. si:ⁿŋg)	N	سینگ	horn
1428.	si:ⁿŋg	N	سینگ	horn

	(cf. si:ⁿŋ)			
1429.	su:ⁿD (cf. su:ⁿR)	N_f	سونڈ	elephant's trunk
1430.	su:ⁿŋ (cf. su:ⁿŋg)	V_i/V_t	سونگ (سونگھ)	smell, sniff, inhale
1431.	su:ⁿŋg (cf. suⁿŋ)	V_i/V_t	سونگ(سونگھ)	smell, sniff, inhale
1432.	su:ⁿR (cf. su:ⁿD)	N_f	سونڑ	elephant's trunk
1433.	se:ⁿm	N_m	سیم	kidney bean
1434.	se:ⁿn	N	سین	white spot
1435.	so:ⁿT (cf. so:T)	N_f	سونٹ (سونٹھ)	dry ginger
1436.	sɛ:ⁿt	V_t	سینت	arrange
1437.	sɔ:ⁿp	V_t	سونپ	entrust
1438.	sɔ:ⁿf	N_m	سونف	aniseed
1439.	zApt	N_m	زپت (ضبط)	restraint, control, check; possession, seizure, confiscation
1440.	zAxm f~zAxAm	N_m	زخم	wound
1441.	zArb	N_m/N_f	ضرب	beating, striking; multiplying
1442.	zAr	N_m	زر	wealth; money
1443.	zArd f~zArAd	Adj	زرد	yellow; orange
1444.	zId	N_f	ضد	obstinacy; opposition
1445.	zIkr f~zIkAr	N_m	زکر	remberance
1446.	zUlm	N_m	ظلم	tyrany
1447.	zUlf	N_f	زلف	lock of hair, tresses
1448.	zAⁿm	Pred Adj	ضم	contraction; conjunction
1449.	zAⁿn	N_f	زن	woman

1450	zA^{n}ŋ (cf. zA^{n}ŋg)	N_m	زنگ	rust
1451.	zA^{n}ŋg (cf. zA^{n}ŋ)	N_m	زنگ	rust
1452.	za:t	N_f	ذات	caste
1453.	za:d	N_m	زاد	twenty-first letter of the Urdu alphabet
1454.	za:l	N_m	ذال	thirteenth letter of the Urdu alphabet
1455.	ze:	N_m	زے	sixteenth letter of the Urdu alphabet
1456.	ze:b	N_m	زیب	beauty, grace, elegance
1457.	ze:r	N_m; Pred Adj	زیر	the vowel marker for I and i:
1458.	zo:	N_m	زو	twenty third letter of the Urdu alphabet
1459.	zo:r (cf. jo:r)	N_m	زور	power, force
1460.	zɛ:r	N_m	زیر (زہر)	poison
1461.	zɔ:x	N_m	ذوخ (ذوق)	taste, enjoyment, delight
1462.	ʃAb	N_f	شب	night
1463.	ʃAT	N_f	شٹ	shirt
1464.	ʃAjr f~ʃAjAr	N_m	شجر	tree
1465.	ʃAk	N_m	شک	doubt
1466.	ʃAxs	N_m	شخص	person, individual
1467.	ʃAr	N_m	شر	evil; wrong doing
1468.	ʃArt	N_f	شرط	condition, term

1469	ʃArm f~ʃArAm	N_f	شرم	shame
1470.	ʃArf	N_m	شرف	privilege; precedence; dignity; excellence
1471.	ʃIv	N_m	شو	Lord Shiva
1472.	ʃUkr f~ʃUkAr	N_m	شکر	thanks; gratitude
1473.	ʃA^{n}ms	N_m	شمس	sun
1474.	ʃa:	N_m	شا(شاہ)	title assumed by the fakirs
1475.	ʃa:d	Pred Adj	شاد	delighted, glad
1476.	ʃa:z	Adj	شاز	uncommon, unusual extraordinary, rare, exceptional
1477.	ʃa:x	N_f	شاخ	branch, bough
1478.	ʃa:l	N_f	شال	shawl
1479.	ʃI:	N_m	شی	hushing sound
1480.	ʃI:r	N_f	شیر	a sweet dish made of milk
1481.	ʃe:x	N_m	شیخ	Sheikh: one of the four classes into which Muslims are divided.
1482.	ʃe:r	N_m	شعر	couplet
1483.	ʃe:r	N_m	شیر	lion
1484.	ʃo:x	Adj	شوخ	bright; humorous, playful, amusing
1485.	ʃo:r	N_m	شور	noise
1486.	ʃɛ:	N_m	شے(شہ)	king
1487.	ʃɛ:	N_f	شے	thing, article, commodity
1488.	ʃɔ:x	N_m	شوخ (شوق)	desire, ardor, fancy (for)

1489.	ʃa:ˈm	N_f	شام	evening
1490.	ʃa:ˈn	N_f	شان	glory, dignity
1491.	ʃi:ⁿn	N_m	شین	nineteenth letter of the Urdu alphabet
1492.	xApt	N_m	خپت(خبط)	madness, insanity
1493.	xAbz	N_m	خبض(قبض)	constipation
1494.	xAt	N_m	خط	letter; line
1495.	xAd	N_m	خد(قد)	height
1496.	xAs	N	خس	fragrant grass
1497.	xAr	N_m	خر	ass
1498.	xAr	N_m	خر	sound of snoring
1499.	xArc f~xArAc	N_m	خرچ	expenditure
1500.	xAlb	N_m	خلب(قلب)	heart
1501.	xAlx	N_f	خلخ(خلق)	creation; mankind; people
1502.	xIst	N_f	خست(قسط)	instalment
1503.	xIsm f~xIsAm	N_f	خسم(قسم)	division; kind, species; nature
1504.	xUd	Recip Pron	خود	self, oneself
1505.	xUʃ	Adj	خوش	happy, glad
1506.	xUʃk	Adj	خشک	dry
1507.	xUl	N_m	خل(قل)	first word of some suras of the holy Qur'an
1508.	xa:b (cf. xwa:b)	N_m	خواب	dream
1509.	xa:b	N_m	خاب(قاب)	large plate
1510.	xa:k	N_f	خاک	dust, ashes
1511.	xa:f (cf. xe:)	N_m	خاف	twenty-seventh letter of the Urdu alphabet
1512.	xa:s	Adj	خاص	special

1513.	xa:ʃ	N_f	خاش (قاش)	piece, slice
1514.	xa:l	N_m	خال	a black mole on the face (regarded as ornamental)
1515.	xu:b	Adj; Adv	خوب	splendid, pleasing; good
1516.	xe:	N_m	خے	tenth letter of the Urdu alphabet
1517.	xe: (cf. xa:f)	N_m	خے	twenty-seventh letter of the Urdu alphabet
1518.	xo:l	N_m	خول	case; cover
1519.	xɛ:	N_f	خے (قے)	vomiting
1520.	xɛ:r	N_m	خیر(قہر)	vengeance, rage; calamity
1521.	xɛ:d	N_f	خید(قید)	confinement, imprisonment
1522.	xɛ:r	N_f; Adv	خیر	well-being; anyway, well
1523.	xɔ:f	N_m	خوف	fear, terror
1524.	xɔ:l	N_m	خول(قول)	saying; quotation
1525.	xwa:b (cf.xa:b)	N_m	خواب	dream
1526.	xa:ⁿm	Adj	خام	raw, unripe; imperfect; inexperienced
1527.	xa:ⁿn	N_m	خان	Khan: a title bestowed on Muslim nobles
1528.	xu:ⁿn	N_m	خون	blood
1529.	xɔ:ⁿm	N_f	خوم(قوم)	caste; nation; people
1530.	ɣAT	N_m	غٹ	sound of gulping
1531.	ɣAʃ	N_m	غش	fainting,

				insensibility
1532.	γArk (cf. γArx)	N_m; Adj	غرک (غرق)	drowning, sinking; drowned, sunk
1533.	γArx (cf. γArk)	N_m; Adj	غرخ (غرق)	drowning, sinking; drowned, sunk
1534.	γUl	N_m	غل	noise, din, outcry
1535.	γA^{n}m	N_m	غم	sorrow; grief
1536.	γa:r (cf. ga:r)	N	غار	cave, den
1537.	γo:l	N_m	غول	crowd, multitude, herd
1538.	γɛ:b	N_m	غیب	absence; event of futurity
1539.	γɛ:r	N_m, Adj	غیر	stranger, rival; other
1540.	γɔ:s	N_m	غوث	name of a Muslim saint
1541.	γɔ:r	N_m	غور	close attention, deep thought
1542.	γɛ:^{n}n	N_m	غین	twenty-fifth letter of the Urdu alphabet
1543.	hAps	N_m	ہپس (حبس)	suffocation, confinement
1544.	hAd	N_f	حد	limit, boundry
1545.	hAT	N_f	ہٹ	obstinacy
1546.	hAT	V_i	ہٹ	retreat
1547.	hAj	N_m	حج	pilgrimage to Mecca
1548.	hAg	V_t	ہگ	go to stool
1549.	hAzm f~hAzAm	N_m	ہضم	digestion, concoction
1550.	hAʃr f~hAʃAr	N_m	حشر	day of resurrection

1551.	hAx	N_m	حق (حق)	right
1552.	hAl	N_m	حل	solution
1553.	hAl	N_m	ہل	plough
1554.	hAlx f~hAlAx	N_m	حلق (حلق)	fauces; throat
1555.	hAr	Adj	ہر	every, each, any
1556.	hlfs (cf. hlvz)	N_m	حفس	memorize
1557.	hlvz (cf. hlfs)	N_m	حفظ	memorize
1558.	hls	N_f	حس	feeling, sense
1559.	hll	V_i	ہل	vibrate, shake
1560.	hlrs	N_f	حرص	greediness, avidity, desiring eagerly
1561.	hUk	N_m	ہک	hook
1562.	hUkm f~hUKUm	N_m	حکم	order, command
1563.	hUsn	N_m	حسن	beauty
1564.	hA^{n}m	Pers Pron	ہم	we; I
1565.	hA^{n}md	N_f	حمد	praise (of god); hymn
1566.	hA^{n}ns	N_m	ہنس	swan, goose
1567.	hA^{n}s	V_i	ہنس	laugh
1568.	hl^{n}nd	N_m	ہند	India
1569.	ha:t (cf.^{h}a:t^{h})	N_m	ہات	hand
1570.	ha:t^{h} (cf.ha:t)	N_m	ہاتھ	hand
1571.	ha:l	N_m	ہال	hall
1572.	ha:l	N_m	حال	condition
1573.	ha:r	N_m	ہار	garland; necklace
1574.	ha:r	N_f	ہار	defeat, loss
1575.	ha:r	V_i	ہار	be defeated;

				lose
1576.	hi:	Adv; Emph Pcl	ہی	only; merely
1577.	hi:l	N_f	ہیل	heel
1578.	hu:r	N_f	حور	houri; virgin of paradise
1579.	he:	N_m	ہے	ninth letter of the Urdu alphabet
1580.	he:	N_m	ہے	thirty-fourth letter of the Urdu alphabet
1581.	ho:	V_i	ہو	happen, become
1582.	ho: (cf. $^{h}\varepsilon$)	Pres Aux	ہو	are (second person neutral)
1583.	ho:ʃ	N_m	ہوش	conciousness, sense
1584.	hɛ: (cf. hɛ:^{n}; ho:)	Pres Aux	ہے	is (general sg.)
1585.	hɛ:T	N	ہیٹ	hat
1586.	hɔ: (cf. ha:^{n})	Adv; Intrj	ہو (ہاں)	yes; indeed
1587.	hɔ:z	N_m	حوض	reservoir, pool
1588.	hɔ:l	N_m	ہول	fright; horror
1589.	ha:^{n} (cf.hɔ:)	Adv; Intrj	ہاں	yes; indeed
1590.	ha:^{n}p	V_i	ہانپ	be out of breath, pant
1591.	ha:^{n}k	V_t	ہانک	drive; boast
1592.	hi:^{n}ŋ (cf hi:^{n}ŋg)	N_m	ہینگ	asafoetida
1593.	hi:^{n}ŋg (cf. hi:^{n}ŋ)	N_m	ہینگ	asafoetida
1594.	ho:^{n}T	N_m	ہونٹ	lip
1595.	hɛ:^{n} (cf. hɛ)	Pres Aux	ہیں	are (general plural)
1596.	wa:	Intrj	واہ(واہ)	well done!,

				bravo!
1597.	wo: (cf. vo:)	Demon Pron	وو(وہ)	he, she, it (remote)
1598.	wa:^{n} (cf. va:^{n})	Adv	واں(وہاں)	there, yonder, thither
1599.	lAb	N_m	لب	lip
1600.	lAt	N_f	لت	habbit (bad); vice
1601.	lAt	N_f	لت	creeper, tendril
1602.	lAd	V_t	لد	be loaded
1603.	lAT	N_f	لٹ	lock of hair
1604.	lAT (cf. lAT^{h})	N_f	لٹ	bamboo; stick
1605.	lAT^{h} (cf. lAT)	N_f	لٹھ	bamboo; stick
1606.	lAg	V_t	لگ	be attached; seem, appear
1607.	lavz	N_m	لفظ	word
1608.	lAs	N_m	لس	viscosity, stickiness
1609.	lAR	V_t	لڑ	fight
1610.	llp	V_t	لپ	be plastered
1611.	llk (cf. llk^{h})	V_t	لک	write
1612.	llk^{h} (cf. llk)	V_t	لکھ	write
1613.	lUtf	N_m	لطف	pleasure
1614.	lUT	V_t	لٹ	be robbed, be cheated
1615.	lA^{n}NT (cf. lA^{n}NT^{h})	Adj	لنٹ	stupid; contentious
1616.	lA^{n}NT^{h} (cf. lA^{n}NT)	Adj	لنٹھ	stupid; contentious
1617.	lA^{n}ND	N_m	لنڈ	penis
1618.	la:	V_t	لا	bring
1619.	la:b	N_m	لاب(لابھ)	profit, advantage

	(cf. la:b^h)			
1620.	la:b^h (cf. la:b)	N_m	لابھ	profit, advantage
1621.	la:t	N_f	لات	leg; kick
1622.	la:d	V_t	لاد	load
1623.	la:T	N_m	لاٹ	lord
1624.	la:D (cf. la:R)	N_m	لاڈ	love, affection (for a child)
1625.	la:j	N_f	لاج	shyness; modesty
1626.	la:k (cf. la:k^h)	Adj	لاک	lakh: one hundred thousand
1627.	la:k^h (cf. la:k)	Adj	لاکھ	lakh: one hundred thousand
1628.	la:f	N_f	لاف	self-praise
1629.	la:g	N_f	لاگ	correlation; bearing
1630.	la:ʃ	N_f	لاش	dead body, corpse
1631.	la:l	N_m	لعل	pearl
1632.	la:l	Adj	لال	red
1633.	la:R (cf. la:D)	N_m	لاڑ	affection, love (for a child)
1634.	li:p (cf. le:p)	V_t	لیپ	plaster; colorwash with yellow soil mixed with cowdung
1635.	li:d	N_f	لید	dung (of horses, etc.)
1636.	li:k	N_f	لیک (لکھ)	egg of louse
1637.	li:k	N_m	لیک	leak
1638.	lu:	N_f	لو	hot wind; heatstroke
1639.	lu:T	N_f	لوٹ	robbery

1640	lu:T	V_t	لوٹ	rob, plunder
1641.	le:	V_t	لے	take
1642.	le:p	N_m	لیپ	soft plaster, ointment
1643.	le:T	Pred Adj	لیٹ	late
1644.	le:T	V_i	لیٹ	lie down, take rest
1645.	lo:t (cf. lo:t^h)	Adj	لوت	incapacitated
1646.	lo:t^h (cf. lo:t)	Adj	لوتھ	incapacitated
1647.	lo:T	V_t	لوٹ	roll, toss about
1648.	lo:D	N_m	لوڈ	load
1649.	lo:g	N_m	لوگ	people, public
1650.	lo:R	N_f	لوڑ	wish, desire
1651.	lɛ:	N_f	لے(لہ)	singing in tune; melody
1652.	lɛ:s	N	لیس	lace
1653.	lɛ:s	Adj	لیس	attained to perfection; dressed
1654.	lɛ:r	N_f	لیر (لہر)	wave; burn, ache
1655.	lɔ:	N_f	لو	flame
1656.	lɔ:T	V_t	لوٹ	turn back; return
1657.	la:^{n}m	N_m	لام	thirtieth letter of the Urdu alphabet
1658.	la:^{n}ŋ (cf. la:^{n}ŋg)	V_t	لانگ(لانگھ)	jump (over), spring (over)
1659.	la:^{n}ŋg (cf. la:^{n}ŋ)	V_t	لانگ (لانگھ)	jump (over), spring (over)
1660.	la:^{n}R	N_m	لانڑ	testicles
1661.	lɔ:^{n}ŋ (cf. lɔ:^{n}ŋg)	N	لونگ	clove; nosepin
1662.	lɔ:^{n}ŋg	N	لونگ	clove; nosepin

	(cf. lɔ:ⁿŋ)			
1663.	rAb	N_m	رب	God; lord, master
1664.	rAt (cf. rAtʰ)	N_m	رت	chariot
1665.	rAt	V_i	رت	be dyed red
1666.	rAtʰ (cf. rAt)	N_m	رتھ	chariot
1667.	rAT	V_t	رٹ	memorize
1668.	rAc	V_i	رچ	be stained; color
1669.	rAk (cf. rAkʰ)	V_t	رک	keep, put, place
1670.	rAkʰ (cf. rAk)	V_t	رکھ	keep, put, place
1671.	rAg	N_f	رگ	artery, vein
1672.	rAs	N_m	رس	juice
1673.	rAsm f~rAsAm	N_f	رسم	custom, tradition
1674.	rIs	V_i	رس	leak, drop slowly
1675.	rUt	N_f	رت	season
1676.	rUk	V_i	رک	stop; stay
1677.	rUx	N_m	رخ	face; aspect
1678.	rAⁿñj	N_m	رنج	sorrow, grief
1679.	rAⁿŋ (cf. rAⁿŋg)	N_m	رنگ	color
1680.	rAⁿŋ (cf. rAⁿŋg)	V_t	رنگ	color
1681.	rAⁿŋ (cf. rAⁿŋg)	N_m	رنگ	color
1682.	rAⁿŋg (cf. rAⁿŋ)	V_t	رنگ	color
1683.	rIⁿŋg (cf. rIⁿŋ)	N_f	رنگ	ring
1684.	rIⁿŋg (cf.rIⁿŋ)	N_f	رنگ	ring
1685.	ra:	N_f	را (راہ)	road, way, path

1686.	ra:t	N_f	رات	night
1687.	ra:j	N_m	راج	raj: rule, government
1688.	ra:k (cf. ra:k^h)	N_f	راک	ashes
1689.	ra:k^h (cf. ra:k)	N_f	راکھ	ashes
1690.	ra:g	N	راگ	raw sugar, molasses
1691.	ra:g	N_m	راگ	music
1692.	ra:s	N_f	راس	heap, mass, pile
1693.	ra:z	N_m	راز	secret,
1694.	ra:l	N_f	رال	saliva
1695.	ri:t	N_f	ریت	custom, practice
1696.	ri:c	N_m	ریچ	bear
1697.	ri:l	N_f	ریل	reel
1698.	ri:R (cf. ri:R^h)	N_f	ریڑ	back-bone, spine
1699.	ri:R^h (cf. ri:R)	N_f	ریڑھ	back-bone, spine
1700.	ru:	N_f	رو (روح)	soul; spirit
1701.	ru:p	N_m	روپ	appearance, image; beauty
1702.	ru:T (cf. ru:T^h)	V_i	روٹ	be vexed, displeased
1703.	ru:T^h (cf. ru:T)	V_i	روٹھ	be vexed, displeased
1704.	ru:s	N_m	روس	Russia
1705.	re:	N_m	رے	fourteenth letter of the Urdu alphabet
1706.	re:t	N_f	ریت	sand
1707.	re:T	N_m	ریٹ	rate
1708.	re:s	N_f	ریس	race
1709.	re:l	N_f	ریل	rail

1710.	ro:	V_i	رو	weep, wail
1711.	ro:b	N_m	رعب	aweinspiring presence
1712.	ro:D	N_f	روڈ	road
1713.	ro:k	N_f	روک	ban, restriction
1714.	ro:k	V_t	روک	stop; obstruct; prohibit
1715.	ro:g	N_m	روگ	disease
1716.	ro:z	N_m; Adv	روز	day; daily
1717.	rɛ:	V_i	رے	remain, stay
1718.	ra:^{n}D	N_m	رانڈ	widower
1719.	ra:^{n}m	N_m	رام	Lord Rama
1720.	ra:^{n}n	N_f	ران	thigh
1721.	ru:^{n}m	N_m	روم	room
1722.	re:^{n}ŋ (cf. re:^{n}ŋg)	V_t	رینگ	creep
1723.	re:^{n}ŋg (cf. re:^{n}ŋ)	V_t	رینگ	creep
1724.	rɔ:^{n}d	V_t	روند	trample (on), tread (down); crush
1725.	Re:	N_m	ڑے	fifteenth letter of the Urdu alphabet
1726.	yAk	Adj	یک(ایک)	one, single
1727.	ya:	Conj	یا	or, else, either
1728.	ya:	Intrj	یا	O!, Oh!
1729.	ya:d	N_f	یاد	rememberance, recollection
1730.	ya:r	N_m	یار	friend
1731.	ye:	N_m	یے	thirty-fifth letter of the Urdu alphabet
1732.	ye:	Demon Pron	یہ	this; he, she, it; these; they (prox.)

1733	ya:^{n}	Adv	یاں (یہاں)	here
1734.	yu:^{n}	Adv	یوں	in this manner: just so
1735.	y⊃:^{n}m	N_m	یوم	day